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EDITOR
Lawrence W. Mills, Chicago, Illinois

ASSOCIATE EDITOR
Margaret Hatchell, Chicago, Illinois

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Cover Picture.—The new Los Angeles County Osteopathic Hospital as it looked in mid-July, 1957. Students of the College of Osteopathic Physicians and Surgeons will have their clinical training in this excellent teaching hospital of 500 beds, which will be completed early in 1958. It was constructed at a cost of $9,220,000 by the people of Los Angeles County.

OSTEOPATHIC EDUCATION

LAWRENCE W. MILLS
Director, Office of Education
American Osteopathic Association
Chicago, Illinois

Osteopathic college enrollment 1957-58

The number of applications for admission to osteopathic colleges for the academic year starting in the fall of 1957 was the largest since 1951, when the peak of applications from veterans of World War II was reached. The year 1951 represented the last when applicants could be considered with only 2 years of preprofessional training, and in that year approximately 30 per cent of all applicants to osteopathic colleges had completeed only the minimum of 2 years.

During recent years there has been an appreciable number of last-minute cancellations by applicants who have paid deposits on their first-year's tuition. For that reason all osteopathic colleges have granted acceptances to about 10 per cent more entering students than actual capacity before starting "alternates." During the summer of 1957 preceding actual matriculation of entering students, the percentage of cancellations was the lowest of any year since the end of World War II. Consequently, in some of the osteopathic colleges the entering class was a few more than actual capacity. This has resulted in sectionalizing classes, especially for laboratory work. The first-year classes in the fall of 1957, consequently, represent the largest entering classes in recent history.

TABLE I—ENROLLMENT 1957-58

	First-Year Students	Second-Year Students	Third-Year Students	Fourth-Year Students	Total
CCO	73	64	57	45	239
COPS	105	89	88	86	368
DMS	82	59	52	48	241
KC	105	92	101	83	381
KCOS	104	71	86	78	339
PCO	84	86	86	97	353
Total	553	461	470	437	1,921

The abbreviations used for the osteopathic colleges in all the tables in this Supplement are as follows:

CCO—Chicago College of Osteopathy
COPS—College of Osteopathic Physicians and Surgeons
DMS—Des Moines Still College of Osteopathy and Surgery
KC—Kansas City College of Osteopathy and Surgery
KCOS—Kirksville College of Osteopathy and Surgery
PCO—Philadelphia College of Osteopathy

Graduating classes

In the spring of 1957 the six osteopathic colleges graduated classes of 442 students, which represents a drop of approximately 20 graduates from the total number of graduates in 1956. By 1959 it is expected that the graduating classes will return to the peak of approximately 460.

TABLE II—GRADUATING CLASSES

College	Number of Graduates 1957	Estimated Number of Graduates 1958
CCO	63	45
COPS	85	86
DMS	49	48
KC	89	83
KCOS	61	78
PCO	95	97
Total	442	437

Enrollment since 1948

TABLE III—ENROLLMENT SINCE 1948

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
CCO	188	215	242	237	240	221	223	235	232	239
COPS	279	336	356	359	348	344	336	346	355	368
DMS	235	264	292	278	254	246	227	226	218	241
KC	223	248	222	318	342	365	366	378	370	381
KCOS	315	386	410	374	368	343	331	319	316	339
PCO	283	329	354	362	365	378	384	379	375	353
Total	1523	1778	1876	1928	1917	1897	1867	1883	1866	1921

Table III shows the undergraduate enrollment in the six osteopathic colleges since 1948. By 1949 the fund-raising program of the American Osteopathic Association had resulted in increased facilities and additional faculty for the training of approximately 400 more students so enrollment increased yearly from 1948 to 1951. The total enrollment of the four classes in the six osteopathic colleges for the academic year 1957-58 represents the largest number of students since 1951. In 1951 the enrollment included two graduating classes in two osteopathic colleges, and this year marked the end of the accelerated program in those colleges.

Women students in osteopathic colleges

Table IV shows the distribution of women students in the various osteopathic colleges by classes. It will be noticed that 14 women students were admitted for the classes starting in the fall of 1956 and only 9 in the fall of 1957. There has been a continued decrease in the number of women students in osteopathic colleges for the past several years.

The study and training required for men and women in osteopathic education are the same. Professional careers in osteopathic medicine result in the same remuneration for women as for men. In the osteopathic profession women occupy high offices in professional organizations and serve on faculties of osteopathic colleges and on hospital and clinic staffs.

TABLE IV—NUMBER OF WOMEN IN OSTEOPATHIC COLLEGES, 1957-58

College	First-Year Students	Second-Year Students	Third-Year Students	Fourth-Year Students	Total
CCO	1	2	1	0	4
COPS	4	3	0	3	10
DMS	1	0	0	1	2
KC	0	3	2	4	9
KCOS	2	2	0	1	5
PCO	1	2	1	2	6
Total	9	12	4	11	36

Undoubtedly the professions of nursing and teaching today are attracting many women who may have considered a medical career but failed to pursue it because of the length and cost of training. The comparatively new fields of medical technology, occupational therapy, medical librarianship, medical recorders, and the many other essential occupations in the healing arts, which are necessary on the health team, are attracting young women who are interested in the healing arts field in general.

Actually the admissions committees of osteopathic colleges report that the ratio between acceptances and applications is higher for women than it is for men at present.

Preprofessional training of first-year students

Table V lists the preprofessional colleges by states where first-year students in 1957 received their required training for entrance into osteopathic colleges. The 553 first-year students represent 216 colleges in 38 states and in Hawaii and Canada.

TABLE V—WHERE OSTEOPATHIC FIRST-YEAR STUDENTS RECEIVED PREPROFESSIONAL TRAINING, FALL 1957

STATE AND COLLEGES	CCO	COPS	DMS	KC	KCOS	PCO	TOTAL
ALABAMA							0
ARIZONA							
Arizona State College, Tempe		2	1		1		4
University of Arizona		1	1				2
Total		3	2		1		6
ARKANSAS							
University of Arkansas				1			1
Total				1			1
CALIFORNIA							
Fresno State College		4					4
LaVerne College		1					1
Long Beach State College		7					7
Los Angeles State College		3					3
Loyola University		5					5
Occidental College		1					1
Pepperdine College		6					6
Pomona College		1					1
Sacramento State College		1					1
San Diego State College		2					2
San Jose State College					1		1
Stanford University		1					1
University of California, Berkeley		3					3
University of California, Los Angeles		25	2				27
University of California, Santa Barbara		2					2
University of San Francisco		1					1
University of Southern California		13	1				14
Whittier College		2					2
Total		78	3		1		82
COLORADO							
University of Colorado					2		2
Total					2		2
CONNECTICUT							0
DELAWARE							0
DISTRICT OF COLUMBIA							
Georgetown University	1				1		2
Total	1				1		2
FLORIDA							
University of Miami				1		1	2
Total				1		1	2
GEORGIA							
Emory University	1						1
Mercer University						1	1
Savannah State College		1					1
University of Georgia					1		1
Valdosta State College					1		1
Total	1	1			2	1	5
HAWAII							
University of Hawaii		1					1
Total		1					1
IDAHO							0
ILLINOIS							
Blackburn College	1						1
Carthage College			1				1
Greenville College						1	1
Illinois Institute of Technology	1						1
Loyola University	2						2
Millikin University		1					1
North Central College	1						1
Northwestern University	1						1
Quincy College					1		1
Roosevelt University	4						4
St. Procopius College	2						2
Southern Illinois University				1	2		3
University of Chicago	1	1					2
University of Illinois	1			1	1		3
Wheaton College	1						1
Total	15	2	1	2	4	1	25
INDIANA							
Ball State Teachers College					1		1
Butler University					1		1
DePauw University					1		1
Goshen College	1						1
Indiana State Teachers College	1				1		1
Indiana University			1		1		2
Manchester College	1						1
Purdue University			1				1
St. Joseph's College	1		1				2
Valparaiso University	1						1
Total	4		3		5		12
IOWA							
Drake University			4				4
Grinnell College	1						1
Iowa Wesleyan College					1		1
Morningside College			1				1
St. Ambrose College			1				1
State University of Iowa			2				2
Upper Iowa University			1				1
Total	1		9		1		11
KANSAS							
Baker University				1			1
Friends University					1		1
Kansas State Teachers College, Pittsburg				2			2
Sterling College					1		1
Tabor College				2			2
University of Kansas		1		3			4
Total		1		8	2		11
KENTUCKY							
Brescia College					1		1
Murray State College	1						1
Villa Madonna College	1						1
Western Kentucky State College				1			1
Total	2			1	1		4
LOUISIANA							0
MAINE							
University of Maine						1	1
Total						1	1
MARYLAND							
Johns Hopkins University				1			1
Morgan State College				1			1
University of Maryland			1				1
Western Maryland College			1				1
Total			2	2			4
MASSACHUSETTS							
Atlantic Union College				1			1
Brandeis University			1				1
Harvard University						1	1
Springfield College						1	1
University of Massachusetts						1	1
Total			1	1		3	5

STATE AND COLLEGES	CCO	COPS	DMS	KC	KCOS	PCO	TOTAL
MICHIGAN							
Albion College	1						1
Alma College					1		1
Aquinas College	2						2
Detroit Institute of Technology		1	1	1			3
Eastern Michigan College			1	1	1		3
Emmanuel Missionary College				2			2
Ferris Institute	3		1				4
Great Lakes College					1		1
Hillsdale College			3				3
Kalamazoo College			1				1
Michigan College of Mining and Technology					1		1
Michigan State University	1		3	1			5
Olivet College				2			2
University of Detroit	2		4	2	7		15
University of Michigan	1	1	3	1	2		8
Wayne State University	16		7	1	2		26
Western Michigan College				1			1
Total	26	2	24	12	15		79
MINNESOTA							0
MISSISSIPPI							0
MISSOURI							
Central Missouri State College				4			4
Culver-Stockton College					1		1
Drury College				1			1
Missouri Valley College					1		1
Northeast Missouri State Teachers College				1	10		11
Northwest Missouri State College				1			1
Park College				1			1
Rockhurst College				1			1
St. Louis College of Pharmacy					1		1
St. Louis University					1		1
Southeast Missouri State College				2			2
University of Kansas City				3			3
University of Missouri		1			3		4
Washington University					1		1
Total		1		14	18		33
MONTANA							0
NEBRASKA							
Creighton University			1				1
Doane College				1			1
Union College				1			1
Total			1	2			3
NEVADA							0
NEW HAMPSHIRE							
Dartmouth College				1			1
Total				1			1
NEW JERSEY							
Rutgers University		1	2	2		1	6
St. Peter's College				1			1
Seton Hall University					1		1
Upsala College				1	1		2
Total		1	2	4	2	1	10
NEW MEXICO							0
NEW YORK							
Alfred University					1		1
Brooklyn College	2	1	1	1			5
City College of New York				1	1	1	3
Colgate University		1					1
Columbia University	1				3	2	6
Cornell University	1				1	1	3
Fordham University		1					1
Long Island University	1	1	3	2	3	1	11
New York University	1		1	2		1	5
St. Bonaventure University	1	1			1		3
St. John's University					2		2
St. Lawrence University						1	1
State Teachers College, Cortland				1			1
Syracuse University		1					1
University of Buffalo					3		3
University of Rochester			1				1
Wagner Lutheran College						1	1
Total	7	6	6	7	15	8	49
NORTH CAROLINA							
Wake Forest College						1	1
Total						1	1
NORTH DAKOTA							
University of North Dakota				1			1
Total				1			1
OHIO							
Bowling Green State University				1	1		2
Central State College	1						1
John Carroll University	2		1	3			6
Kent State University		1	1	3	1	1	7
Kenyon College					2		2
Miami University	1						1
Mount Union College					2		2
Ohio Northern University			1	1			2
Ohio State University			2	2	1		5
Ohio University	1			1			2
Ohio Wesleyan University					1		1
University of Cincinnati					1		1
University of Dayton	1		5				6
University of Toledo	1		1	2	2		6
Western Reserve University		1		2	1		4
Wittenberg College					1		1
Xavier University	1						1
Youngstown University	2		4				6
Total	10	2	15	15	13	1	56

STATE AND COLLEGES	CCO	COPS	DMS	KC	KCOS	PCO	TOTAL
OKLAHOMA							
Bethany-Nazarene College					1		1
Cameron State Agricultural College				1			1
Central State College				2			2
Northeastern State College				1			1
Oklahoma A & M College				2	1		3
Southwestern State College				2			2
University of Oklahoma					1		1
University of Tulsa				2			2
Total				10	3		13
OREGON							
Oregon State College					1		1
Total					1		1
PENNSYLVANIA							
Alliance College				1			1
Elizabethtown College						1	1
Franklin and Marshall College	1					2	3
Gannon College				1		1	2
Gettysburg College			1			3	4
Grove City College				1	3		4
King's College					1		1
La Salle College	1			2		2	5
Lincoln University						3	3
Lycoming College					1	1	2
Moravian College				1			1
Pennsylvania Military College		1				1	2
Pennsylvania State University	2	1	1			3	7
Philadelphia College of Pharmacy and Science						9	9
St. Joseph's College					1	6	7
St. Vincent College			1			1	2
Temple University		1	2	1	1	16	21
Thiel College						1	1
University of Pennsylvania			1		3	4	8
University of Pittsburgh					1	2	3
University of Scranton						1	1
Villanova University						5	5
Westminster College						1	1
Total	4	3	6	7	11	63	94
RHODE ISLAND							
Providence College				1		1	2
University of Rhode Island						1	1
Total				1		2	3
SOUTH CAROLINA							
The Citadel				1			1
Total				1			1
SOUTH DAKOTA							
South Dakota State College				1			1
University of South Dakota				1			1
Total				2			2
TENNESSEE							
Middle Tennessee State College					1		1
Southern Missionary College		2		2			4
Tusculum College	1						1
Total	1	2		2	1		6
TEXAS							
Baylor University				2			2
East Texas State Teachers College				1			1
Howard Payne College				1			1
St. Mary's University				2			2
Southern Methodist University					1		1
Texas Technological College				3			3
Texas Wesleyan College				1			1
University of Texas			2				2
West Texas State College				1			1
Total			2	11	1		14
UTAH							0
VERMONT							0
VIRGINIA							
University of Richmond					1		1
Total					1		1
WASHINGTON							
Eastern Washington College of Education					1		1
University of Washington		1	1				2
Walla Walla College				1			1
Whitman College					1		1
Total		1	1	1	2		5
WEST VIRGINIA							
West Virginia University					1		1
Total					1		1
WISCONSIN							
University of Wisconsin	1		2				3
Total	1		2				3
WYOMING							
University of Wyoming						1	1
Total						1	1
CANADA							
University of British Columbia		1					1
Total		1					1
GRAND TOTALS	73	105	82	105	104	84	553

States leading in number of first-year students

Table VI lists those states which lead in the number of first-year students in osteopathic colleges in 1957, and the number of colleges from which they came.

Table VII shows the states leading in the number of first-year students in osteopathic colleges in the fall of 1956.

It will be noticed that Pennsylvania, which led in 1956, showed a 10 per cent increase in 1957; Michigan, which ranked third in 1956, showed over 25 per cent increase in 1957; and Ohio, which ranked fifth in 1956, showed 65 per cent increase. This increase in the above-mentioned states is largely due to outstanding vocational guidance efforts of the state osteopathic societies.

The preprofessional training of 70 per cent of the six entering classes was furnished by colleges in six states. In these states are located more than 50 per cent of the entire osteopathic profession. In five of the six states are a large number of osteopathic institutions, such as hospitals and clinics, as well as four of the six osteopathic colleges. In the fall of 1957, however, the College of Osteopathic Physicians and Surgeons in Los Angeles showed the highest percentage of out-of-state students, 20 per cent, since 1946.

Table VIII lists the number of preprofessional colleges and states represented in the first-year classes of the six osteopathic colleges.

TABLE VI—STATES LEADING IN NUMBER OF FIRST-YEAR STUDENTS, 1957

State	Number of Colleges	Number of First-Year Students
Pennsylvania	23	94
California	18	82
Michigan	17	79
Ohio	18	56
New York	17	49
Missouri	14	33

TABLE VII—STATES LEADING IN NUMBER OF FIRST-YEAR STUDENTS, 1956

State	Number of Colleges	Number of First-Year Students
Pennsylvania	24	84
California	23	79
Michigan	12	63
New York	20	56
Ohio	18	34
Missouri	6	31

TABLE VIII—REPRESENTATION OF PREPROFESSIONAL COLLEGES AND STATES IN FIRST-YEAR CLASSES, 1957

College	First-Year Enrollment	Number of Colleges Represented	Number of States Represented
CCO	73	45	12
COPS	105	40*	15†
DMS	82	48	17
KC	105	72	22
KCOS	104	69	23
PCO	84	39	12

*Including University of British Columbia
†Including Canada

It will be noticed that the Kansas City College of Osteopathy and Surgery and the Kirksville College of Osteopathy and Surgery are represented by students from more states and more preprofessional colleges than any of the other osteopathic colleges.

Preprofessional colleges training largest number of first-year students

Table IX lists the five preprofessional colleges which trained the largest number of entering students in the fall of 1957. For comparative purposes, Table X lists the five colleges which trained the largest number of first-year students entering in the fall of 1956.

TABLE IX—PREPROFESSIONAL COLLEGES TRAINING LARGEST NUMBER OF FIRST-YEAR STUDENTS, 1957

College	State	Number of First-Year Students
University of California, Los Angeles	California	27
Wayne State University	Michigan	26
Temple University	Pennsylvania	21
University of Detroit	Michigan	15
University of Southern California	California	14

TABLE X—PREPROFESSIONAL COLLEGES TRAINING LARGEST NUMBER OF FIRST-YEAR STUDENTS, 1956

College	State	Number of First-Year Students
Wayne University	Michigan	26
University of California, Los Angeles	California	20
Temple University	Pennsylvania	20
Northeast Missouri State Teachers College	Missouri	18
Long Island University	New York	14

Nearly 20 per cent of the entering students in the osteopathic colleges received their training in the five colleges and universities listed in Table IX. Representatives of the osteopathic profession periodically appear before the premedical students of the University of California at Los Angeles, Wayne State University, Temple University and the University of Detroit. The College of Osteopathic Physicians and Surgeons also holds an annual "Open House," largely sponsored by the student body of the professional school, to which are attracted each year a large number of premedical students and faculty advisers. Last year 6,500 people attended that "Open House." Educational meetings are sponsored each year by the Wayne County Osteopathic Association in Detroit, to which are invited faculty and students from colleges and universities in the Detroit area.

Geographic distribution of osteopathic students, 1957

Table XI shows the geographic distribution of the entire osteopathic predoctorate enrollment according to their residence and the osteopathic college which they are attending in relation to the total number of osteopathic physicians located in the various states.

TABLE XI—GEOGRAPHIC DISTRIBUTION OF OSTEOPATHIC STUDENTS, 1957

State or Country	CCO	COPS	DMS	KC	KCOS	PCO	Total Students	Total D.O.'s
Alabama	1						1	4
Alaska					1		1	0
Arizona		2	3	2	1		8	103
Arkansas				2			2	25
California	4	323	5	22	4		358	2,231
Colorado	1			2	2		5	219
Connecticut	1	1			1	3	6	68
Delaware			2			2	4	26
Dist. of Columbia				1	1	1	3	18
Florida	4		1	8	7	1	21	385
Georgia	1			2	4	1	8	77
Hawaii	1	2	2		1		6	11
Idaho							0	44
Illinois	38	1	2	7	16		64	384
Indiana	11		1	2	14		28	176
Iowa			25		6		31	475
Kansas	1			11	3		15	206
Kentucky	2			4	4		10	39
Louisiana					1		1	15
Maine	1				3	2	6	210
Maryland			1	4		2	7	22
Massachusetts	1	1	1	3	3	4	13	253
Michigan	82	7	77	29	42		237	1,340
Minnesota	2		1	1	6		10	87
Mississippi		1		1			2	6
Missouri			1	52	37		90	1,189
Montana				2	2		4	49
Nebraska			2	4			6	68
Nevada							0	29
New Hampshire							0	25
New Jersey	5	2	5	25	19	56	112	380
New Mexico	1				2		3	108
New York	31	5	28	40	46	42	192	479
North Carolina	1				1		2	36
North Dakota			1	5	1		7	14
Ohio	25	6	28	41	36	6	142	774
Oklahoma			2	22	8		32	367
Oregon			1	4	3		8	146
Pennsylvania	9	3	25	32	29	225	323	1,265
Rhode Island		1	1	1	1	5	9	79
South Carolina					1		1	11
South Dakota			4		3		7	50
Tennessee	1		2	4	1		8	73
Texas	1	1	4	32	12		50	627
Utah							0	21
Vermont					1		1	36
Virginia				2	1	1	4	34
Washington	2	3	3	1	2		11	168
West Virginia	1		1	5	6	2	15	114
Wisconsin	4		6	1	1		12	167
Wyoming							0	17
Canada	1	1	1	2	4		9	110
British Guiana	1			1			2	0
British West Indies			1	1			2	0
Cambodia			1				1	0
China	2	2		1			5	0
El Salvador				1			1	0
Greece					1		1	0
Iran		5	1				6	0
Jordan	3						3	0
Korea					1		1	0
Malaya				1			1	0
Peru		1					1	0
Puerto Rico			2				2	0
Other Foreign Countries							0	78
Totals	239	368	241	381	339	353	1,921	12,938

Length of preprofessional training

Tables XII and XIII show the length of preprofessional training which the matriculants into osteopathic colleges had completed upon entrance in 1956 and 1957.

In 1957, it will be noticed, there was a decrease of 2.5 per cent of entering students with college degrees. On the other hand, it is pointed out that the entering classes in the six osteopathic colleges are the youngest classes at any time since the end of World War II. Economic pressure undoubtedly is limiting more and more students to the minimum length of preprofessional training. In other words, a higher percentage of students entering osteopathic colleges have definitely planned their preosteopathic course at the start of their freshman year in undergraduate colleges.

TABLE XII—LENGTH OF PREPROFESSIONAL TRAINING OF OSTEOPATHIC MATRICULANTS, FALL OF 1957

College	3 years	3+ years	Degree	Advanced Degree	Total
CCO	11	14	47	1	73
COPS	14	16	73	2	105
DMS	9	14	58	1	82
KC	16	18	65	6	105
KCOS	16	21	65	2	104
PCO	4	7	72	1	84
Total	70	90	380	13	553
			70%		

TABLE XIII—LENGTH OF PREPROFESSIONAL TRAINING OF OSTEOPATHIC MATRICULANTS, FALL OF 1956

College	3 years	3+ years	Degree	Advanced Degree	Total
CCO	9	11	45	3	68
COPS	16	23	50	4	93
DMS	7	15	40	2	64
KC	12	12	62	6	92
KCOS	11	12	60	1	84
PCO	4	4	81	5	94
Total	59	77	338	21	495
			72.5%		

The Bureau of Professional Education and Colleges of the American Osteopathic Association and the American Association of Osteopathic Colleges emphasize a good background of English and general education, in addition to the prerequisite courses in the fields of chemistry, biology, and physics. The average student who is interested in the healing arts in general is apt to be one who primarily is interested in science. Many students make up their minds to become physicians during their high school courses in biology or chemistry and upon entering undergraduate college naturally pursue their primary interest, which, in most cases, is a scientific one.

It is natural for the preprofessional student contemplating entering one of the healing arts to choose science, whether chemistry or biology or a combination of both, as one of his majors. In most undergraduate colleges and universities, strong courses in English, foreign language, and the humanities are required for graduation.

The average entering student in osteopathic colleges in 1957 had completed 112 semester hours, including 24 semester hours of chemistry, 24 semester hours of biologic science, 8 semester hours of physics, and 12 semester hours of English. The average entering student, therefore, had spent exactly one half of his time in the field of science and one half of his time

in English and the humanities during his preprofessional college training.

For the past 3 years correlation studies have been made of the osteopathic college first-year students upon the completion of their first year. Grades in the various basic science courses presented the first year were compared with grades made in the various science courses in preprofessional colleges. In general, it has been found that as a result of these studies, there is very little correlation between quality of work done during the first year and the amount of preprofessional courses in the science area. For example, upon comparing grades made in physiologic chemistry during the first year and the amount of chemistry completed prior to entrance, it was found that the correlation coefficient was 0.24. The number of chemistry courses, therefore, that a student completes in preprofessional colleges does not have much bearing on the student's success in physiologic chemistry.

There is a definite correlation, however, between the quality of work done in physiologic chemistry and the quality of work which had been completed in undergraduate chemistry courses. There is very little indication that the amount of work done in undergraduate biologic sciences has any bearing on the quality of work done in anatomy and physiology.

The highest correlation coefficient was found to be in the general over-all scholastic average of preprofessional college work and the over-all scholastic average at the end of the first year. This coefficient, based on the last three entering classes, is 0.69. It also is pointed out that preparation in English apparently predicts just as well as the over-all scholastic average the quality of the student's work in the first year of professional study.

Combined degrees

Many students entering osteopathic colleges are interested in securing a B.A. or B.S. degree either before matriculating in the professional school or after completing the first year in the osteopathic college. A number of colleges of arts and sciences have agreed to confer the baccalaureate degree upon their students who do satisfactory work for 3 years and then successfully complete their first year in an approved osteopathic college.

In recent years the combined degree has been granted to students who have completed their first year's work in an osteopathic college by the following colleges and universities:

George Pepperdine College, Los Angeles
Roosevelt University, Chicago, Illinois
DePauw University, Greencastle, Indiana
Iowa Wesleyan College, Mount Pleasant, Iowa
St. Ambrose College, Davenport, Iowa
Albion College, Albion, Michigan
Alma College, Alma, Michigan
Central Michigan College, Mount Pleasant, Michigan
Hillsdale College, Hillsdale, Michigan
Michigan State University, East Lansing, Michigan
Western Michigan College, Kalamazoo, Michigan
St. John's University, Collegeville, Minnesota
Northeast Missouri State Teachers College, Kirksville, Missouri
University of Omaha, Omaha, Nebraska
Brooklyn College, Brooklyn, New York
Colgate University, Hamilton, New York
St. Lawrence University, Canton, New York
Syracuse University, Syracuse, New York
University of Buffalo, Buffalo, New York
Denison University, Granville, Ohio
Kent State University, Kent, Ohio
University of Toledo, Toledo, Ohio
Phillips University, Enid, Oklahoma
Thiel College, Greenville, Pennsylvania
West Texas State Teachers College, Canyon ,Texas
Utah State Agricultural College, Logan, Utah
Concord College, Athens, West Virginia
West Virginia Wesleyan College, Buckhannon, West Virginia

National osteopathic college scholarships

The Auxiliary to the American Osteopathic Association inaugurated a scholarship program in the fall of 1949. Five osteopathic scholarships of $1,000 each have been awarded each year. In 1958 seven will be awarded. Information about the scholarships is mailed each fall to the deans of approved colleges of arts and sciences throughout the United States and Canada. The scholarships are applied to the college tuition at the rate of $500 per year for the first 2 years in the osteopathic colleges in which the applicants matriculate. Applications for the scholarships for the entering classes in 1958 will close May 1, 1958.

A scholarship applicant must have received at least tentative acceptance from an osteopathic college in order to be eligible to make application for scholarship aid. Information about the scholarship program can be secured from the Office of Education, American Osteopathic Association, 212 East Ohio Street, Chicago 11, Illinois.

Scholarship awards will be made on the basis of quantity and quality of preprofessional work, personality factors, financial need, and motivation toward the osteopathic school of medicine.

In 1957, the five scholarship winners were as follows:

Name	Preprofessional College Attended	Osteopathic College Entered
Capi J. Fishleigh	Eastern Washington College of Education, Cheney, Wash.	Kirksville College of Osteopathy and Surgery
Donald S. Harner	Whittier College Whittier, California	College of Osteopathic Physicians and Surgeons
George F. Murphy	University of Kansas City Kansas City, Missouri	Kansas City College of Osteopathy and Surgery
Robert W. Murray	North Central College Naperville, Illinois	Chicago College of Osteopathy
Bartram M. Rettner	University of Miami Coral Gables, Florida	Kansas City College of Osteopathy and Surgery

Additional scholarship aid

The Auxiliary to the California Osteopathic Association for several years has been awarding one scholarship a year to an applicant to the College of Osteopathic Physicians and Surgeons in Los Angeles. Information regarding this scholarship aid may be obtained by writing Mrs. James C. Long, 2722 West 111th Street, Inglewood, California.

The Maine Osteopathic Association initiated a scholarship program in 1953 which provides $500 toward tuition during the first year for a student who has received his preprofessional training in an approved college or university in the state of Maine and who has been accepted for admission to any of the

osteopathic colleges. Information regarding this scholarship may be obtained by writing to Dr. John M. Thurlow, Professional Building, Waterville, Maine.

The staff of the Garden City Hospital, Garden City, Michigan, initiated a scholarship program in 1954 which will provide annually at least $360 to be applied toward tuition. The applicant must be a resident of the state of Michigan and must show evidence of financial need. Information about these scholarships may be obtained by writing Dr. John T. Baker, treasurer, Garden City Hospital Scholarship Fund, 1810 North Telegraph Road, Dearborn, Michigan.

The Eastern District of the Oklahoma Osteopathic Association has established a scholarship fund. The award is made on the basis of motivation, personality, and the probability of good professional material. Grade point average is also considered in choosing the recipient of the award. The applicant must reside in the state of Oklahoma. Information about this scholarship may be obtained by writing Dr. M. J. Schwartz, secretary-treasurer, Eastern Oklahoma Osteopathic Association, 705-06 Manhattan Building, Muskogee.

The Canadian Osteopathic Association awards two scholarships a year to young men and women in Canada who are planning to study osteopathy and to practice in any province of Canada. Information about these scholarships may be obtained by writing to Miss Joyce S. Currie, secretary, Canadian Osteopathic Association, 609 Medical Arts Building, Montreal 25, Quebec, Canada.

Various loan funds are maintained and administered by the osteopathic colleges for third- and fourth-year students. The American Osteopathic Association for many years has administered a large loan fund, which is available to osteopathic students in their third and fourth years upon recommendation of their respective college deans.

The Osteopathic Foundation also maintains a student loan fund for third- and fourth-year students in osteopathic colleges who are recommended by their faculty committees. Inquiries may be sent to the chairman of the Osteopathic Foundation, Student Loan Fund Committee, 212 East Ohio Street, Chicago 11.

Educational Standards for Osteopathic Colleges*

Approved by the Board of Trustees of the American Osteopathic Association

Admission requirements

1. A minimum of three years of college training in a college or university accredited by a regional educational association is desirable for admission to professional education in an osteopathic college.† An applicant for admission must have completed at least one-half of the required credit for a baccalaureate degree in an accredited college to be considered for admission to an osteopathic college. In exceptional cases, a duly recognized and approved osteopathic college may request that the academic credentials of a highly qualified student, who has completed his preprofessional work in a college or university not accredited by a regional educational association, be evaluated by the Bureau of Professional Education and Colleges of the American Osteopathic Association. Approval of such credentials by the Bureau must be obtained before admission of any such exceptional student to an osteopathic college. Each such case shall be considered upon an individual basis.

All transcripts of records from other schools shall be obtained directly from such schools. Transcripts presented directly by the applicant will not be acceptable.

The official transcript of each applicant must show the satisfactory completion of the following minimum credits in basic subjects prior to admission:

English	6 semester hours (12 hours recommended)
Physics	‡6 to 8 semester hours
Biology	‡6 to 8 semester hours (12 hours recommended)
Inorganic Chemistry	8 semester hours
Organic Chemistry	4 to 8 semester hours, including both the aliphatic and benzene compounds

It is desirable that the elective subjects afford a broad educational and cultural background.

2. The American Council on Education has evaluated the content and quality of the various educational programs conducted by the Armed Forces and has issued a "Guide to the Evaluation of Educational Experiences in the Armed Forces" to assist educational institutions, desiring to do so, to award proper college credits for specific courses taken in these programs.

The following statement is accepted by the American Osteopathic Association as a basis for the evaluation of equivalency of college credits:

College credits (except in science courses requiring laboratory work or except blanket credits for military services not based on courses or examinations) may be based either on (a) courses taken from the Armed Forces Institute or in service courses of the Armed Forces according to the "Guide to the Evaluation of Educational Experiences in the Armed Forces" of the American Council on Education, or (b) performance in the General Educational Development Tests of the American Council on Education.

3. In addition to the academic requirements listed in paragraphs 1 and 2, applicants to osteopathic colleges shall be selected on the basis of academic performance, osteopathic motivation and personal qualifications.

4. With the consent of the Bureau of Professional

*Revised and issued by the Bureau of Professional Education and Colleges of the American Osteopathic Association, 1956.

†Undergraduate college programs are accredited by the following five regional educational associations:

Middle States Association of Colleges and Secondary Schools
North Central Association of Colleges and Secondary Schools
Northwest Association of Secondary and Higher Schools
Southern Association of Colleges and Secondary Schools
Western College Association

The New England Association of Colleges and Secondary Schools is not an accrediting agency, but has standards for membership similar to those maintained by the above five accrediting agencies. Membership in the New England Association of Colleges and Secondary Schools is recognized by the American Osteopathic Association as approval of the colleges in that area.

All approved undergraduate colleges require high school graduation or its equivalent for admission.

‡Whichever is a complete year's course in the college involved.

Education and Colleges, upon due individual consideration, not more than two years of time credit may be accorded to students presenting credentials from other than osteopathic professional schools. Neither time credit nor subject credit shall be accorded, unless such credit can unmistakably be interpreted as the equivalent of courses in the same subjects over the same period of time in the osteopathic college which grants the credit.

5. Credit for work done in other approved medical schools may be accorded only after the most careful individual evaluation.

Educational standards

(Minimum requirements)

1. *Organization.*—

An osteopathic college shall be incorporated as a non-profit institution.

The Board of Trustees shall be composed of persons, including a strong representation of laymen, interested in the advancement of the osteopathic school of practice. No member or officer of the Board shall receive financial remuneration from the operation of the college or its associated teaching hospitals. The members of the Board shall serve sufficiently long terms so that continuity of the institution's program will be carried out without precipitate change in policy. Since the Board of Trustees is the responsible corporate body and is required to establish policy in the direction and guidance of the administration and the educational activities of the institution, it follows that a member of the administrative staff or faculty should not be a member or officer of the Board of Trustees.

The institution must be organized to conform to accepted standards of professional education as to business management, faculty and professional staff.

Since the proper teaching of osteopathic medicine cannot be accomplished with the revenue derived through income from students, an acceptable college must show adequate additional income.

The primary objective of the college shall be to provide an educational program which will prepare osteopathic physicians and surgeons for general practice in osteopathic medicine. Such an additional program will afford the proper foundation for any course of continuing training as may prove desirable.

Administration and faculty shall consist of persons who are (a) devoted to the primary objective of the college, (b) possessed of such qualifications and purposes as will assure the perpetuation of the osteopathic school of medicine, and (c) inspired toward the further development of distinctive osteopathic contribution to the broad field of medicine.

The evaluating agency for osteopathic teaching institutions is the American Osteopathic Association, acting through its Board of Trustees on recommendation of the Bureau of Professional Education and Colleges.

The college shall afford to proper representatives of the American Osteopathic Association unhampered opportunities to study and inspect the facilities, students, faculty and administration, including a study of all records, credentials, grading, promotion and graduation procedures.

The colleges shall fill out, annually, student personnel information blanks for the Association's records and supply lists of students by classes in order that accurate information may be recorded in the files of the Association. The college shall complete annual college survey blanks as requested by the Bureau of Professional Education and Colleges of the American Osteopathic Association.

The college shall seek membership in the American Association of Osteopathic Colleges and enter into agreement with the members of that Association and the Bureau of Professional Education and Colleges of the American Osteopathic Association as to credits to be granted and regulations to be followed in the transference of students from one osteopathic college to another.

2. *Administration.*—

The college shall be under the direction and supervision of a president, dean or other executive officer, selected because of his particular training and experience and capable of interpreting the prevailing standards for osteopathic education. This individual shall have authority to carry these standards into effect. Appointment and promotion of the administrative staff shall be made by the Board of Trustees, on the recommendation of the executive officer. Appointment and promotion of the faculty shall be made by the Board of Trustees on the recommendation of the chief executive officer, who shall transmit to the Board of Trustees the recommendations of the dean developed through consultation with the department chairmen.

The number of students for which the institution can adequately provide an educational program shall be taken into consideration in determining the necessary faculty and clinical, laboratory and hospital facilities.

A system of faculty-student advisers shall be established, and opportunity for frequent personal contact between members of the faculty and of the student body shall be provided.

Each college shall publish a catalog not less frequently than every other year. Catalogs shall list the courses available, the faculty members and the time schedule. Catalogs shall set forth the entrance requirements, tuition fees, and such general information as is necessary to the members of the student body. The list of students enrolled each year shall be included.

A committee of the faculty for the evaluation of entrance credentials shall assist the executive officer in evaluating the qualifications of applicants.

Faculty meetings shall be held at stated intervals at which time reports of the various faculty committees shall be presented to the faculty.

Records of preliminary education and certification thereof shall be kept on file permanently for examination by proper officials. The system of records must show in detail throughout the college course, the attendance record, grade and any other notations useful in evaluating the total work of each student.

Students shall be required to be in actual attendance within the first week of each term for which they receive credit. Each student shall be required to be in actual attendance in the institution during the four years required for his undergraduate work unless time credit has been accorded for work actually pursued in attendance at another osteopathic college approved by the American Osteopathic Association or in other similarly approved colleges. Students shall complete at least the last year of their undergraduate course in residence in the college which confers the degree.

No credit shall be accorded in courses where the record indicates attendance of less than 80 per cent.

Graduates must be at least 21 years of age at the time of graduation.

3. *Faculty.*—

A competent teaching faculty shall be selected and it shall be organized into departments. In addition to

other qualifications, consideration should be given to thorough training, a successful teaching experience, clinical experience and demonstrated ability or desire to engage in research. In the selection of faculty members, the executive officer should consult with the department heads and transmit to the Board of Trustees recommendations developed through such conferences.

Faculty members should have a reasonable security and tenure.

The faculty roster should list at least ten full-time teachers of professional rank. In the laboratory courses there should be a minimum ratio of one assistant to each 25 students.

A qualified librarian should be employed to supervise and develop the library.

4. *Plant.*—

A college must have for its exclusive use adequate buildings, which provide lecture rooms, laboratories, library and administrative offices.

The medical library should include the modern texts, reference books, and the leading periodicals needed in the teaching program.

5. *Teaching Aids.*—

Each institution should have a museum of pathological and anatomical specimens, and such auxiliary adjuncts, including visual aids, as are desirable for effective teaching.

A sufficient number of cadavers should be provided so that every two students may dissect at least a lateral half.

A supply of animals should be provided for use in the college laboratories. Adequate provision shall be made for their care and housing.

6. *Clinical Facilities.*—

Each college shall operate a general clinic. Histories and records in the clinic shall be maintained and utilized as teaching material. Clinics should be organized so that patients may be cared for in the clinic or in their homes.

Osteopathic colleges must have access, for teaching purposes, to a general hospital or hospitals affiliated with, or under control of, the college.

The college should appoint those who direct the clinical teaching, or supervise the staff concerned with teaching in such hospitals in order that proper supervision can be exercised over students in their contact with patients.

Students should have opportunity of observing and studying a wide variety of diseases ranging from the common case problems to the complex and rare conditions. The material available should be used to its greatest teaching value. The student class should be so organized as to afford the closest possible approach to individual instruction.

Clinical clerkships should be provided. Students should observe, keep records and administer treatment under the supervision of the teaching staff.

An obstetrical clinic must be conducted so that each student shall be properly trained in the care and management of obstetrical cases. All areas of clinical participation shall be under the supervision of the responsible teaching class. A carefully prepared report and summary shall be compiled by the student for each case under observation.

Students shall attend post-mortem examinations under the direction of the Department of Pathology. Each student shall prepare protocols on at least six post-mortem examinations.

Training Criteria for the Clinical Clerkship in the Hospital:

Clinical clerkship programs in hospitals which are not on the campus of an approved college, and not under the immediate authority of the college administration, shall be approved only in hospitals having the approval of the American Osteopathic Association for either intern or residency training or both.

Facilities for clinical clerkship training under the immediate authority of the college which fall in categories other than outpatient clinics and approved hospitals shall be inspected and appraised for approval on an individual basis.

The program must provide educational experience in the various departments of the hospital.

There must be a definite program of instruction, including case recording and study, clinical observation, collateral reading, didactic work and a regular program of staff lectures, clinical conferences, etc.

There must be adequate daily supervision of the student, and his progress must be reported regularly to the college.

A properly qualified individual must be designated as in charge of the clerkships in the affiliated institution. This individual should be directly responsible to the dean of the college with which the hospital is affiliated.

The clinical faculty in the affiliated institution must be composed of qualified members properly organized as a teaching faculty.

The sufficiency and diversity of clinical material in the affiliated institutions should determine the number of students to be trained at any one time.

Such programs shall be evaluated by the Bureau of Professional Education and Colleges in the accreditation procedure for the colleges.

7. *Curriculum.*—

Since the osteopathic profession and its colleges maintain their independence and distinction in the general field of medicine because of the contribution which osteopathy makes to the prevention, the diagnosis and the treatment of disease, and because the importance of maintaining the structural integrity of the body should be recognized and emphasized in all departments of practice, approved osteopathic colleges are required to give adequate and comprehensive training in the principles and practice of osteopathic diagnosis and therapeutics. This requirement includes, first, the presentation of special courses of instruction in distinctively osteopathic subjects, particularly applied anatomy and physiology, osteopathic principles, structural pathology and osteopathic manipulative technics.

In addition to the special courses named hereafter, the course content of the basic science subjects—anatomy, physiology, chemistry, pathology, bacteriology and immunology—should include the presentation and discussion of structural pathologies, their presence, their effects, their influence on anatomical relationships, the physiological and chemical reactions of the body, the progression of pathological changes, and the natural resistance of the body to the invasion of microorganisms.

During the clinical years, the part played by structural pathologies in the etiology, pathology, diagnosis, prognosis and treatment of all classifications of diseases shall be presented and fully discussed. The incorporation of structural findings in case records and the application of osteopathic manipulative treatment, whenever indicated, shall be required in the management of every teaching case in the outpatient clinic and the teaching hospital.

The curriculum in a college of osteopathy should be presented in a minimum of four standard academic years of at least one thousand (1000) hours each and

should include adequate and comprehensive instruction in:

Parasitology	Anatomy
Immunology	Embryology
Radiology	Histology
Surgery	Physiology
Orthopedic Surgery	Biochemistry
Urology	Pharmacology
Otorhinolaryngology	Toxicology
Ophthalmology	Sanitation
Anesthesiology	Bacteriology
Osteopathic Principles, Practice and Technic	Comparative Therapeutics
	Materia Medica—associated subjects
Internal Medicine	Pathology
Neurology	Public Health—Preventive Medicine
Psychiatry	Hygiene
Pediatrics	Obstetrics and Gynecology
Dermatology and Syphilology	Osteopathic Medicine
Therapeutics	
Tropical Medicine	

8. *Degree.*—

Inasmuch as the degree of Doctor of Osteopathy is a time-honored designation, conferred by colleges of osteopathy to distinguish the graduates of the osteopathic school of practice; since it is a term legalized by charters of all osteopathic colleges and a legal term written into many laws governing the practice of osteopathic physicians and surgeons; since it is the term used in literature, reference books, governmental regulations (national, state, local, etc.) to designate graduates of this school; since it serves to distinguish such graduates from graduates of other schools of the practice of the healing arts; since it has become a well-confirmed precedent in designation of osteopathic physicians; since much labor has been expended to identify the degree with its exponents; therefore, the only degree to be used by an approved osteopathic college qualifying candidates for examination for licensure to practice the healing arts shall be the degree, Doctor of Osteopathy.

It is not intended thereby to prevent approved osteopathic colleges from granting honorary degrees nor degrees in courses of such nature as shall be warranted by courses undertaken in whole or in part in the approved college.

Admission procedures at the College of Osteopathic Physicians and Surgeons

GRACE B. BELL, D.O.

Dean, College of Osteopathic Physicians and Surgeons
Los Angeles, California

Admission procedures at the College of Osteopathic Physicians and Surgeons are the responsibility of an Admissions and Credentials Committee, of which the dean is chairman, the registrar is secretary, and the president is an ex-officio member. Of the eight appointed members, four are chosen from the basic science faculty and four from the clinical departments.

The committee is reappointed annually by the president on recommendation of the dean. Meetings are called by the chairman and their frequency is determined by the amount of business to be transacted and its urgency. In addition to admissions procedures, the committee is charged with promotions, disciplinary problems, and recommendations for graduation, which are made to the Executive Committee of the Faculty.

In the conduct of admissions procedures at the College of Osteopathic Physicians and Surgeons, the distribution of the necessary forms and information is a responsibility of the office of the dean. Preliminary correspondence with prospective students and informal interviews are carried on by the dean. Prospective applicants are encouraged to visit the College, particularly when the annual Open House is held, and to consult the dean or registrar about preprofessional problems.

The prospective student who makes formal application for admission to the College sends to the office of the registrar a completed, signed application form. The applicant is further required to request that official transcripts of record from all preprofessional colleges attended be sent to the office of the registrar of the College. To complete the admission requirements, all applicants request the Educational Testing Service to supply the College with the scores attained by the applicant in the Medical College Admissions Test.

The preliminary processing of applications is handled by the registrar and his clerical assistants. A good deal of information contained in the application requires amplification and processing. Certain of the prospective student's preprofessional teachers or the chairman of the premedical advisory board or recommendations committee of his school is requested by the registrar to give further information on a standard personal rating form which the College supplies. Premedical advisory committees usually return their own completed forms, suited to their methods of screening.

The recommendations of preprofessional teachers and advisors are treated as highly confidential and are relied upon quite heavily in student evaluation. In our experience these recommendations have proved very helpful in student selection, particularly in appraising nonintellectual characteristics of applicants. Upon completion of the freshman year, the registrar informs the deans of preprofessional colleges of the performance of students from these colleges.

Each applicant supplies the name of one or more professional people as references. Frequently, though not invariably, these are osteopathic physicians. While the College is deeply appreciative of the cooperation of members of the profession in interesting prospective students in osteopathy as a career, in general the recommendations sent to the Admissions Committee lack objectivity. Some of the component osteopathic organizations have committees which are very helpful in advising our Admissions Committee regarding motivation, personality, character, aptitude, and interest of applicants from their immediate vicinities.

Transcripts of record are examined carefully to determine whether or not the applicant has completed the scholastic requirements of the college. If any deficiencies are noted, they are promptly pointed out to the applicant and a reply outlining a plan for removal of deficiencies is requested.

Subject requirements for admission serve definite purposes. In the opinion of the administration of the College, no applicant should be accepted who could not in every way satisfy licensure requirements in the state or states of his choice. Certain entrance requirements are designed to serve this purpose.

An acceptable applicant should have a reasonable expectancy of being able to compete successfully with classmates in satisfying the requirements for the D.O. degree—specific admission requirements insure an equal opportunity for all who start a professional education. The scholastic achievements of the applicants are next evaluated as to performance in science and non-science preprofessional studies. There is a close correlation between the grade point average which an applicant attains in preprofessional scientific subjects and the grade point average he achieves in his first 3 years at the College of Osteopathic Physicians and Surgeons.

Selected data for fifty-seven members of the class of 1956 who had completed approximately equal amounts of preprofessional work and whose Medical College Admission Test scores were available showed a positive correlation of 0.53 between preprofessional science grade point averages and 3 years' grade point averages at the College of Osteopathic Physicians and Surgeons. When the Medical College Admission Test scores for these persons were added as a variable in predicting performance in the same 3 years, the efficiency of prediction was not improved.[1]

The Medical College Admissions Test scores have been used in some instances to add to the information furnished by available data in transcripts of record, personal evaluations, and other sources. When some time has elapsed since the student last attended a liberal arts college, a recent Medical College Admissions Test will often serve better in predicting his probable scholastic record than his science grade point average.

Those applicants who can conveniently make the trip to the College are given appointments for interviews by members of the Admissions and Credentials Committee. Most of the interviews are conducted by a group of three interviewers with one interviewee. At times it may be more convenient for the interviewers to meet an applicant individually.

The interviews serve several purposes. The prospective student is given an opportunity to become acquainted with some of the individuals who are to determine his eligibility to enter the college as a student. The interviewers can attempt to appraise the applicant by exploring areas which are not fully covered by the data which have been accumulated in his application. Motivation and interest in the profession can be discussed more fully in a face-to-face situation than by correspondence. Some evidence regarding social trends and maturity may be elicited.

The interview situation provides an opportunity for exploring or improving understanding of the profession, the laws governing practice, the scope of education, and the opportunities for practice expected by the applicant.

When all data have been accumulated, the formal acceptance or rejection of each applicant is directed by the entire Admissions and Credentials Committee. A health report is required from each successful applicant; these reports are usually made by members of the clinical faculty of the College. In some cases special examinations are required if, in the opinion of the Admissions and Credentials Committee, the applicant can be more fairly considered by a more thorough exploration of certain areas.

The members of the Admissions and Credentials Committee at the College of Osteopathic Physicians and Surgeons are earnestly desirous of selecting those applicants who have the greatest promise of becoming effective members of the osteopathic profession. It must be pointed out, however, that there are few if any criteria which can be applied with certainty in predicting the future performance of an applicant.

1721 Griffin Ave.

1. Personal communication from Peter G. Loret, Ph.D., to M. H. Simmers, D.O.

The Rural Clinics Program of the Kirksville College of Osteopathy and Surgery

VERNON H. CASNER, D.O.
Director of Rural and Special Clinics and Professor of Public Health
Kirksville College of Osteopathy and Surgery
Kirksville, Missouri

The Rural Clinics Program of the Kirksville College of Osteopathy and Surgery, which has been in existence for the past 9 years, has as its primary aims the previsions of needed medical services and of educational experience for future physicians. Other aims or objectives are provision of (1) a demonstration or research laboratory in which patients other than indigents serve as teaching material, (2) actual rural practice experience for the future physician, (3) a field laboratory for the problem-solving teaching method infrequently used in medical education, and (4) the opportunity for students to develop individual responsibility through community relationships.

The remedial medicine program is carried out in nine towns and villages at distances ranging from 10 to 32 miles from Kirksville. The preventive medicine phase of the program—physical examinations of school children, immunizations, and health education—extends more widely into communities as far as 75 miles from the College. Rural practitioner offices are provided on the basis of College-community participation in each community receiving remedial service. The community's share is based on ability to provide; in two instances, material needs have been partially or totally provided for by a donation from a citizen of the community. The College maintains a central office for the Clinics, which provides equipment and supplies used occasionally by all the clinics, such as sound projector, film library and catalogues, literature, bookkeeping materials, portable x-ray units, and electrocardiograph. Equipment maintained in community offices is that usually employed by the general practitioner.

Services provided are classified as general and special. General services are those usually provided by a general practitioner in the moderately equipped office or on a home call in such conditions as ordinary uncomplicated acute infectious disease, chronic disease of moderate intensity, minor surgery, and simple emergencies, and for clinical diagnosis. Eighty per cent of human ills fall into this category and are cared for by the

general practitioner. Special services require the equipment and skills of the hospital and the specialty staff and include major surgery, the care of severe infections, difficult or complicated clinical or laboratory diagnosis, and others of such magnitude as to be outside the general practitioner's capabilities or material resources. Certain medical cases may present options of personal choice or economic necessity. Obstetrical cases and certain cases of chronic illness are examples.

Health care is available 24 hours of every day. The hours from 2 to 9 p.m., or until all calls are completed, comprise office hours or "at the place" service. During the rest of the day, calls are made from the Kirksville Osteopathic Hospital. Since these calls entail additional expense, they are usually limited to emergencies which cannot wait until regular office hours at the local clinic office.

Utilities and gasoline mileage make up the bulk of all expense of operating the health service. Patients pay for medication, for mileage at 7 cents a mile, and a basic fee of $1.00 for each office call and $1.50 for each house call to defray operating costs of the clinic and the daily trips to it. Indigent patients are not required to pay, although every effort is made to educate them to include the basic cost of medical care in assistance budgets.

Preventive medicine services consist of yearly examinations of school children, clinics for preschool children, immunization clinics; health education, lectures, distribution of films and literature, school athletic programs, communicable disease detection and reporting, sanitation education and testing, and many other preventive activities. Collaboration with the national, state, and local health agencies is stressed, and private groups concerned with health—for example, the American Tuberculosis Association, the American Heart Association, and the American Cancer Society—are actively supported by clinic personnel as an integral part of community activities. Preventive medicine activities are spread over a larger geographical area than are the remedial medicine services. The former covers a radius of about 70 miles and a population of 80,000 to 90,000. The latter are carried on within a radius of 32 miles and with a population of from 18,000 to 25,000. In one county in the area there is a health unit, and assistance in preventive programs is available through the sanitarian, the dentist, and the nurses comprising the unit; there is no health officer. In three of the counties the county school superintendent organizes and assists the health examinations and immunizations. Assistance is given chiefly by interested parents or club organizations. In many areas, the preventive service of the clinic is the only service available, and it has served to lift rather dreary, neglected health consciousness into a higher, brighter plane.

The utilization of this extensive field of learning opportunity has presented many problems to the College and its hospital. Obviously, if the student must be away from the campus for a time, some adjustment of assignments of lecture attendance, ward walks, laboratory work, and study must be made. Much planning has been done in an effort to have all essential classes completed by the end of the junior year in order to allow the major clinical teaching effort to proceed with a minimum of interference from didactic schedules. As yet, the planning has not succeeded completely even though the junior-senior academic years grant only 1 month's vacation on a rotating basis to the students. However, a satisfactory compromise has been achieved by allocating certain specialty courses, such as radiology and urology, to the senior year and grouping the didactic periods into selected hours.

Much effort has been made to provide laboratory clinical training and develop useful skills in the junior year. The laboratories of the Kirksville Osteopathic Hospital and the affiliated nursing homes and special courses in orientation are being utilized to prepare the student for the teaching of general practice participation in the rural clinics. At present orientation is begun during the freshman and sophomore years in the hope that the future senior students will be still better prepared for the responsibilities of practice under supervision in the clinics.

The present mechanics of operation require the division of the senior class into two equal divisions for (1) clinical assignments and (2) hospital assignments. Each assignment is for 6 months, dividing the student's time equally during the senior year.

Usually two or three senior students are assigned to each rural clinic on an alternate day schedule—Monday, Wednesday, and Friday, and Tuesday, Thursday, and Saturday. Thus, each clinic serves four or six students 3 days a week for the 6 months' assignment. Call duty is rotated on an arranged schedule, but this plan is usually only partially successful since each student in his work in the clinic usually builds his own "practice." His "patients" want him personally to make outcalls as would any family physician. In fact, at each termination of clinic duty much community discussion, dissatisfactions, and even petition and argument result because of the reassignment of "our doctors." Interesting also is the fact that in each graduation audience are dozens of people who are present to see "our doctor" graduate.

A Manual of Procedure is provided as a guide to all anticipated duties, requirements, regulations, and other situations which the student will encounter. A supervisory staff physician visits each clinic daily to consult and advise—professional service is rendered almost without exception by students—and to observe unobtrusively the professional conduct of the students. The supervisory physician reviews diagnostic and treatment outlines prepared by the students, scans treatment schedules which have been approved and are being carried out; signs work orders and prescriptions, reviews case histories, and, on occasion, performs specialty examinations with student assistance. General housekeeping, care of equipment, and other multitudinous details receive the critical analysis of and often guidance from the supervisor.

The supervisory group is largely made up of members of the Division of Osteopathic Medicine of the College, but some help is given by members of the specialty departments. Rotation of supervisors has value in that on different days special problems in different areas receive the attention of a specialist.

Each clinic group is organized to conduct its professional affairs, and weekly meetings are held. Individual conferences of supervisory staff and student personnel are formal, and consultations are ordered, written, and signed as in hospital procedures. The student doctor is granted referring physician status by hospital and specialty department personnel in order that he may develop professional attitudes and habits. Every three weeks all-clinic conferences are held at which special lectures are given and organizational procedures, successes and errors, and items of general interest are discussed. Of special value are the required formal presentations of current case histories for group review and discussion by student colleagues.

Registry of Hospitals

HOSPITALS APPROVED FOR TRAINING OF INTERNS

(For the Period from July 1, 1957, to June 30, 1958)

The length of American Osteopathic Association approved intern training is 12 months.

Allentown Osteopathic Hospital, Allentown, Pennsylvania
Art Centre Hospital, Detroit, Michigan
Audubon Osteopathic Hospital, Audubon, New Jersey
Bangor Osteopathic Hospital, Bangor, Maine
Bashline Osteopathic Hospital & Clinic, Grove City, Pennsylvania
Bay View Hospital, Bay Village, Ohio
Biscayne Osteopathic Hospital, Miami, Florida
Blackwood-Mims Clinic & Hospital, Comanche, Texas
Burbank Hospital, Burbank, California
Cafaro Memorial Hospital, Youngstown, Ohio
Carson City Hospital, Carson City, Michigan
Charles E. Still Osteopathic Hospital, Jefferson City, Missouri
Chicago Osteopathic Hospital, Chicago, Illinois
Civic Center Hospital, Oakland, California
Clare General Hospital, Clare, Michigan
Community Hospital, Houston, Texas
Community Medical Center, North Sacramento, California
Community Memorial Hospital, Moberly, Missouri
Corpus Christi Osteopathic Hospital, Corpus Christi, Texas
Dallas Osteopathic Hospital, Dallas, Texas
Davenport Osteopathic Hospital, Davenport, Iowa
Des Moines General Hospital, Des Moines, Iowa
Detroit Osteopathic Hospital, Detroit, Michigan
Doctors Hospital, Columbus, Ohio
Doctors Hospital, Los Angeles, California
Doctors Osteopathic Hospital, Erie, Pennsylvania
Erie Osteopathic Hospital, Erie, Pennsylvania
Flint General Hospital, Flint, Michigan
Flint Osteopathic Hospital, Flint, Michigan
Forest Hill Hospital, Cleveland, Ohio
Fort Worth Osteopathic Hospital, Fort Worth, Texas
Garden City-Ridgewood Hospitals
  Garden City Hospital, Garden City, Michigan
  Ridgewood Hospital, Ypsilanti, Michigan
Gleason Hospital, Larned, Kansas
*Glendale Community Hospital, Glendale, California
Grand Rapids Osteopathic Hospital, Grand Rapids, Michigan
  Burton Heights Branch, Grand Rapids, Michigan
Grandview Hospital, Dayton, Ohio
Green Cross General Hospital, Cuyahoga Falls, Ohio
Hillside Hospital, San Diego, California
Hospitals of the Kansas City College of Osteopathy and Surgery
  Osteopathic Hospital, Kansas City, Missouri
  Conley Maternity Hospital, Kansas City, Missouri
Hospitals of Philadelphia College of Osteopathy
  The Hospital of Philadelphia College of Osteopathy, Philadelphia, Pennsylvania
  North Center Hospital of Philadelphia College of Osteopathy, Philadelphia, Pennsylvania
Houston Osteopathic Hospital, Houston, Texas
Kirksville Osteopathic Hospital, Kirksville, Missouri
Lakeside Hospital, Kansas City, Missouri
Lakeview Hospital, Milwaukee, Wisconsin
Lamb Memorial Hospital, Denver, Colorado
Lancaster Osteopathic Hospital, Lancaster, Pennsylvania
Laughlin Hospital & Clinic, Kirksville, Missouri
Long Beach Osteopathic Hospital-Magnolia Hospital
  Long Beach Osteopathic Hospital, Long Beach, California
  Magnolia Hospital, Long Beach, California
Los Angeles County Osteopathic Hospital, Los Angeles, California
Madison Street Hospital, Seattle, Washington
Mahoning Valley Green Cross Hospital, Warren, Ohio
Marietta Osteopathic Hospital, Marietta, Ohio
Massachusetts Osteopathic Hospital, Boston, Massachusetts
Maywood Hospital, Maywood, California
McLaughlin Osteopathic Hospital, Lansing, Michigan
Mesa Memorial Hospital, Grand Junction, Colorado
*Metropolitan Hospital, Philadelphia, Pennsylvania
Mineral Area Osteopathic Hospital, Farmington, Missouri
Monte Sano Hospital of Physicians & Surgeons, Los Angeles, California
Mount Clemens General Hospital, Mount Clemens, Michigan
Muskegon Osteopathic Hospital, Muskegon, Michigan
Normandy Osteopathic Hospital, St. Louis, Missouri
Northwest Hospital, Miami, Florida
Oklahoma Osteopathic Hospital, Tulsa, Oklahoma
Ontario Community Hospital, Ontario, California
Orrville Community Osteopathic Hospital, Orrville, Ohio
Osteopathic General Hospital of Rhode Island, Edgewood, Cranston, Rhode Island
Osteopathic Hospital of Harrisburg, Harrisburg, Pennsylvania
Osteopathic Hospital of Maine, Portland, Maine
Parkview Hospital, Toledo, Ohio
Phoenix Osteopathic Hospitals
  Phoenix Osteopathic Hospital, Phoenix, Arizona
  McDowell Branch, Phoenix, Arizona
Pontiac Osteopathic Hospital, Pontiac, Michigan
Portland Osteopathic Hospital, Portland, Oregon
†Rio Hondo Memorial Hospital, Rivera, California
Riverside Hospital, Wilmington, Delaware
Riverside Osteopathic Hospital, Trenton, Michigan
Riverview Osteopathic Hospital, Norristown, Pennsylvania
Rocky Mountain Osteopathic Hospital, Denver, Colorado
Saginaw Osteopathic Hospital, Saginaw, Michigan
San Gabriel Valley Hospital, San Gabriel, California
South Bend Osteopathic Hospital, South Bend, Indiana
Standring Memorial Osteopathic Hospital, Seattle, Washington
Stevens Park Osteopathic Hospital, Dallas, Texas
Still Osteopathic Hospital, Des Moines, Iowa
Traverse City Osteopathic Hospital, Traverse City, Michigan
Tucson General Hospital, Tucson, Arizona
Victory Hospital, North Hollywood, California
Waldo General Hospital, Seattle, Washington
Waterville Osteopathic Hospital, Waterville, Maine
West Side Osteopathic Hospital of York, York, Pennsylvania
Wetzel Osteopathic Hospital, Clinton, Missouri
Wilden Osteopathic Hospital, Des Moines, Iowa
Zieger Osteopathic Hospital, Detroit, Michigan

*Second-year Internship
†Dual Staff

REGISTERED HOSPITALS

(For the Period from July 1, 1957, to June 30, 1958)

Altadena Community Hospital, Altadena, California
Alva Osteopathic Hospital, Alva, Oklahoma
Amarillo Osteopathic Hospital, Amarillo, Texas
Arcade Hospital, North Sacramento, California
Aspermont Hospital & Clinic, Aspermont, Texas
Avon Center Hospital, Rochester, Michigan
Axtell Osteopathic Hospital, Princeton, Missouri
Barnes Osteopathic Hospital & Clinic, King City, Missouri
Bay Osteopathic Hospital, Bay City, Michigan
Bellevue Hospital & Clinic, Houston, Texas
Big Sandy Clinic-Hospital, Big Sandy, Texas
Cadieux General Hospital, Detroit, Michigan
Cape Osteopathic Hospital, Cape Girardeau, Missouri
Cardwell Memorial Hospital, Stella, Missouri
Chesemore Clinic & Hospital, Paris, Tennessee
Clinic Hospital, Nowata, Oklahoma
Coats-Brown Clinic & Hospital, Tyler, Texas
Colorado Hospital, Canon City, Colorado
Community Memorial Hospital, Sturgis, South Dakota
Cottage Hospital, Oildale, California
Crews' Hospital & Clinic, Gonzales, Texas
Currey Clinic-Hospital, Mt. Pleasant, Texas
Delaware Valley Hospital, Bristol, Pennsylvania
Delgado Green Cross Hospital, Ysleta, Texas
Denison Hospital & Clinic, Denison, Texas
Doctor's Hospital, Albuquerque, New Mexico
Doctors' Hospital, Jacksonville, Florida
Doctors Hospital, St. Petersburg, Florida
Donley Osteopathic Hospital & Clinic, Kingman, Kansas
Donovan Osteopathic Hospital & Clinic, Raton, New Mexico
East Liverpool Osteopathic Hospital, East Liverpool, Ohio
Edgewater Hospital, Milwaukee, Wisconsin
Elliston Clinic & Hospital, Covington, Tennessee
Elm Street Hospital & Clinic, Denton, Texas
Elmo Osteopathic Hospital, Elmo, Missouri
Glendale Emergency Hospital, Glendale, California
Granbury General Hospital, Granbury, Texas
Granby Community Hospital, Granby, Missouri
Groom Osteopathic Hospital, Groom, Texas
Guymon Osteopathic Hospital, Guymon, Oklahoma
Harrison Miller Memorial Hospital, Hinton, Oklahoma
Humphreys Osteopathic Hospital, Tuscumbia, Missouri
Hustisford Hospital, Hustisford, Wisconsin
Jackson Osteopathic Hospital, Jackson, Michigan
Joplin General Hospital, Joplin, Missouri
Juniata Park Medical Center, Philadelphia, Pennsylvania
Lakeview General Hospital, Battle Creek, Michigan
Las Olas Hospital, Fort Lauderdale, Florida
Le Roy Hospital, New York, New York
Longs Peak Osteopathic Hospital, Longmont, Colorado
Lubbock Osteopathic Hospital, Lubbock, Texas
Manning General Hospital, Manning, Iowa
Marshfield General Hospital, Marshfield, Wisconsin
Martin Place Hospital, Detroit, Michigan
Mason Clinic & Hospital, Mason, West Virginia
Mayer Hospital & Clinic, Lubbock, Texas
Medford Osteopathic Hospital, Medford, Oregon
Memorial Osteopathic Hospital, Elizabeth, New Jersey
Mesa Osteopathic Hospital, Mesa, Arizona
Miles Osteopathic Hospital, Grapevine, Texas
Mineral Spring Hospital, Louisiana, Missouri
Mt. Pleasant Hospital & Clinic, Mt. Pleasant, Texas
New Mexico Osteopathic Hospital, Albuquerque, New Mexico
New Valley Osteopathic Hospital, Yakima, Washington
Northeast Osteopathic Hospital, Kansas City, Missouri
North Jersey Osteopathic General Hospital, Dumont, New Jersey
Northwest General Osteopathic Hospital, Detroit, Michigan
Orlando Osteopathic Hospital, Orlando, Florida
Ormond Beach Hospital, Ormond Beach, Florida
Osteopathic Hospital of Wichita, Wichita, Kansas
Ottawa Arthritis Hospital & Diagnostic Clinic, Ottawa, Illinois
Ozark Osteopathic Hospital, Springfield, Missouri
Palmer Osteopathic Hospital, Detroit, Michigan
Park View Hospital, Los Angeles, California
Plattner Clinic & Hospital, Grand Prairie, Texas
Point Clinic & Hospital, Point Pleasant, West Virginia
Pool Memorial Hospital, Lindsay, Oklahoma
Porter Clinic-Hospital, Lubbock, Texas
Redfield Clinic Hospital, Redfield, Iowa
Reid Hospital & Clinic, Bethany, Missouri
Riley Sanatorium, North Muskegon, Michigan
Riverside's Osteopathic Hospital, Riverside, California
Roswell Osteopathic Hospital, Roswell, New Mexico
Saco Osteopathic Hospital, Saco, Maine
San Antonio Osteopathic Hospital, San Antonio, Texas
Sandusky Hospital-Clinic, Sandusky, Michigan
Sandusky Memorial Hospital, Sandusky, Ohio
Sequoia Hospital, Fresno, California
Sheridan Community Hospital, Sheridan, Michigan
Southern Oklahoma Osteopathic Hospital, Ardmore, Oklahoma
Still-Hildreth Osteopathic Sanatorium, Macon, Missouri
Stocker Hospital & Clinic, Oconomowoc, Wisconsin
Stratton Hospital & Clinic, Cuero, Texas
Talco Hospital & Clinic, Talco, Texas
Tigua General Hospital, El Paso, Texas
Trenton Osteopathic Hospital, Trenton, Tennessee
Troy Community Hospital, Troy, Pennsylvania
Wellsburg Eye & Ear Hospital, Wellsburg, West Virginia
West Broward Hospital & Clinic, Fort Lauderdale, Florida
Wetzel Osteopathic Hospital, Carrollton, Missouri
Whitaker Osteopathic Hospital, Moberly, Missouri
Willamette Osteopathic Hospital, Albany, Oregon
Willard General Hospital, Manchester, Iowa
Wolfe-Duphorne Hospital, Athens, Texas
Woodland Hospital & Clinic, Sedalia, Missouri

Approved Resident Training Programs

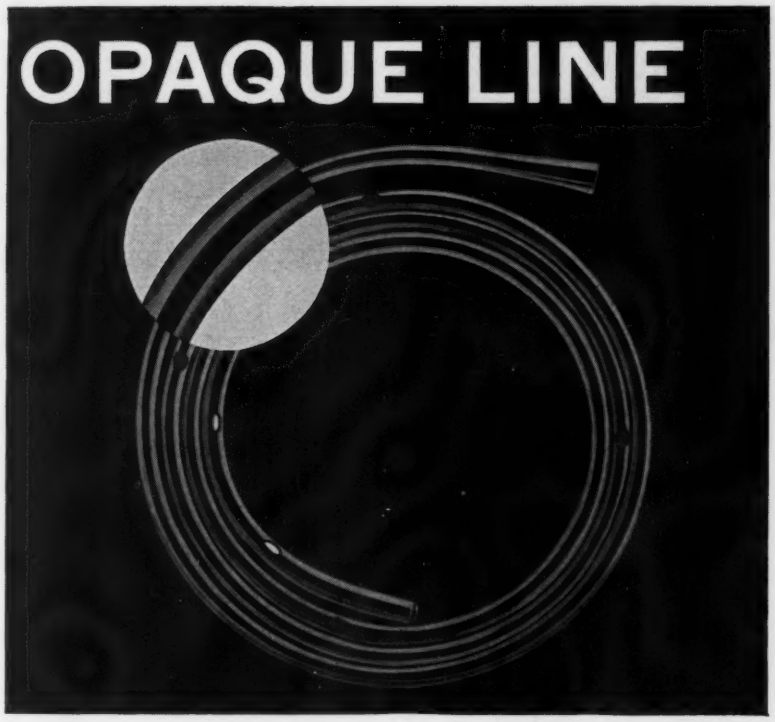
(All Residencies Approved for the Period from July 1, 1957, to June 30, 1958)

The length of the American Osteopathic Association approved training program for each specialty is 3 years. Each hospital is approved for such program but requires recertification each year.

HOSPITAL	RESIDENCIES	NAME
Allentown Osteopathic Hospital Allentown, Pennsylvania	1	Roentgenology
Art Centre Hospital Detroit, Michigan	2	Anesthesiology
	1	Internal Medicine
	1	Obstetrics & Gynecology
	2	Pathology
	2	Radiology
	2	Surgery
Bangor Osteopathic Hospital Bangor, Maine	1	Roentgenology
	1	Surgery
Bay View Hospital Bay Village, Ohio	1	Diagnostic Roentgenology
Chicago Osteopathic Hospital Chicago, Illinois	1	Anesthesiology
	2	Internal Medicine
	2	Obstetrics & Gynecology
	1	Pathology
	1	Pediatrics
	1	Roentgenology
	1	Surgery
Dallas Osteopathic Hospital Dallas, Texas	1	Anesthesiology
	1	Pathology
	1	Surgery
Des Moines General Hospital Des Moines, Iowa	1	Anesthesiology
	1	Radiology
	2	Surgery
Detroit Osteopathic Hospital Detroit, Michigan	6	Anesthesiology
	6	Internal Medicine
	5	Obstetrics & Gynecology
	2	Ophthalmology & Otorhinolaryngology
	3	Orthopedic Surgery
	4	Pathology
	3	Radiology
	8	Surgery
Doctors Hospital Columbus, Ohio	2	Anesthesiology
	2	Internal Medicine
	1	Ophthalmology & Otorhinolaryngology
	2	Orthopedic Surgery
	2	Roentgenology
	3	Surgery
Doctors Hospital Los Angeles, California	1	Surgery
Flint General Hospital Flint, Michigan	1	Anesthesiology
	1	Surgery
Flint Osteopathic Hospital Flint, Michigan	1	Anesthesiology
	2	Internal Medicine
	2	Obstetrics & Gynecology
	2	Pathology
	1	Pediatrics
	2	Radiology
	1	Surgery
Fort Worth Osteopathic Hospital Fort Worth, Texas	1	Surgery
Garden City-Ridgewood Hospital Garden City, Michigan	2	Anesthesiology
	1	Diagnostic Roentgenology
	1	Obstetrical-Gynecological Surgery
	1	Surgery
Glendale Community Hospital Glendale, California	1	Pathology
Grand Rapids Osteopathic Hospital Burton Heights Branch Grand Rapids, Michigan	1	Obstetrical-Gynecological Surgery
	2	Roentgenology
	2	Surgery
Grandview Hospital Dayton, Ohio	2	Anesthesiology
	1	Internal Medicine
	1	Obstetrics & Gynecology
	1	Ophthalmology & Otorhinolaryngology
	2	Orthopedic Surgery
	1	Pathology
	1	Pediatrics
	2	Roentgenology
	2	Surgery
Green Cross General Hospital Cuyahoga Falls, Ohio	1	Anesthesiology
	1	Surgery
Hospitals of the Kansas City College of Osteopathy and Surgery Kansas City, Missouri	2	Anesthesiology
	3	Internal Medicine
	2	Obstetrics & Gynecology
	1	Obstetrical-Gynecological Surgery
	2	Orthopedic Surgery
	2	Pathology
	1	Pediatrics
	1	Proctology
	2	Roentgenology
	2	Surgery
	1	Urological Surgery
Hospitals of Philadelphia College of Osteopathy Philadelphia, Pennsylvania	4	Anesthesiology
	5	Internal Medicine
	3	Obstetrical-Gynecological Surgery
	1	Ophthalmology & Otorhinolaryngology
	1	Orthopedic Surgery
	4	Pathology
	2	Pediatrics
	5	Radiology
	9	Surgery
	1	Urological Surgery
Kirksville Osteopathic Hospital Kirksville, Missouri	2	Anesthesiology
	1	Diagnostic Roentgenology
	1	Internal Medicine
	1	Obstetrics & Gynecology
	2	Ophthalmology & Otorhinolaryngology
	2	Pathology
	2	Surgery
Lakeside Hospital Kansas City, Missouri	1	Anesthesiology
	1	Obstetrical-Gynecological Surgery
	1	Radiology
	2	Surgery
Lakeview Hospital Milwaukee, Wisconsin	1	Internal Medicine
	1	Surgery
Lancaster Osteopathic Hospital Lancaster, Pennsylvania	1	Anesthesiology
	1	Pathology
	1	Roentgenology
	2	Surgery
Laughlin Hospital & Clinic Kirksville, Missouri	2	Surgery
Los Angeles County Osteopathic Hospital Los Angeles, California	2	Anesthesiology
	10	Internal Medicine
	2	Neurology & Neurosurgery
	2	Obstetrics & Gynecology
	2	Ophthalmology & Otorhinolaryngology
	2	Orthopedic Surgery
	4	Pathology
	2	Pediatrics
	2	Physical Medicine and Rehabilitation
	4	Radiology
	3	Surgery
	2	Urological Surgery
Massachusetts Osteopathic Hospital Boston, Massachusetts	1	Surgery
Metropolitan Hospital Philadelphia, Pennsylvania	1	Orthopedic Surgery
	1	Radiology
	1	Surgery
Mount Clemens General Hospital Mount Clemens, Michigan	2	Anesthesiology
	1	Diagnostic Roentgenology
	1	Internal Medicine
	1	Pathology
	1	Surgery
Muskegon Osteopathic Hospital Muskegon, Michigan	1	Diagnostic Roentgenology
Normandy Osteopathic Hospital St. Louis, Missouri	1	Anesthesiology
	1	Diagnostic Roentgenology
	1	Surgery
Oklahoma Osteopathic Hospital Tulsa, Oklahoma	1	Diagnostic Roentgenology
	2	Surgery
Osteopathic General Hospital of Rhode Island Cranston, Rhode Island	1	Diagnostic Roentgenology
Osteopathic Hospital of Harrisburg Harrisburg, Pennsylvania	1	Internal Medicine
Osteopathic Hospital of Maine Portland, Maine	1	Anesthesiology
	1	Internal Medicine
	1	Pathology
	1	Radiology
	1	Surgery
Parkview Hospital Toledo, Ohio	1	Roentgenology
	1	Surgery
Riverside Osteopathic Hospital Trenton, Michigan	2	Anesthesiology
	1	Diagnostic Roentgenology
	1	Internal Medicine
	1	Obstetrics & Gynecology
	2	Surgery
Riverview Osteopathic Hospital Norristown, Pennsylvania	1	Roentgenology
	1	Surgery
Rocky Mountain Osteopathic Hospital Denver, Colorado	1	Radiology
	1	Surgery
Saginaw Osteopathic Hospital Saginaw, Michigan	1	Anesthesiology
	1	Roentgenology
	1	Surgery
South Bend Osteopathic Hospital South Bend, Indiana	1	Diagnostic Roentgenology
Stevens Park Osteopathic Hospital Dallas, Texas	1	Surgery
Still Osteopathic Hospital Des Moines, Iowa	1	Anesthesiology
	1	Diagnostic Roentgenology
	2	Internal Medicine
	1	Obstetrics & Gynecology
	1	Pathology
	1	Pediatrics
	2	Surgery
West Side Osteopathic Hospital of York York, Pennsylvania	1	Radiology
	1	Surgery
Wilden Osteopathic Hospital Des Moines, Iowa	1	Diagnostic Roentgenology
	1	Internal Medicine
Zieger Osteopathic Hospital Detroit, Michigan	1	Anesthesiology
	1	Internal Medicine
	2	Obstetrics & Gynecology
	2	Roentgenology
	2	Surgery

6 reasons why more efficiency, more economy with

EXCLUSIVE DAVOL DUODENAL TUBES (LEVIN STYLE) WITH NEW X-RAY OPAQUE LINE



1. **DISPOSABLE PLASTIC Levin Style Duodenal Tubes are designed and priced for one-time use—may be sterilized if desired in cold solution, by boiling, autoclaving and REUSED.**

2. **Exclusive X-Ray opaque tube assures roentgenological location of tube.**

3. **High quality polyvinyl tubing assures non-irritating smooth surfaces for comfort.**

4. **Distal opening and catheter eyes are finely beveled to minimize trauma; inside surfaces are satin-smooth.**

5. **Available in both transparent and X-Ray – opaque plastic – 50" long – open distal end, 4 eyes and improved funnels.**

6. **Packed in transparent pliofilm envelopes for cleanliness and for ease of identification.**

DAVOL RUBBER COMPANY
PROVIDENCE 2, R. I.

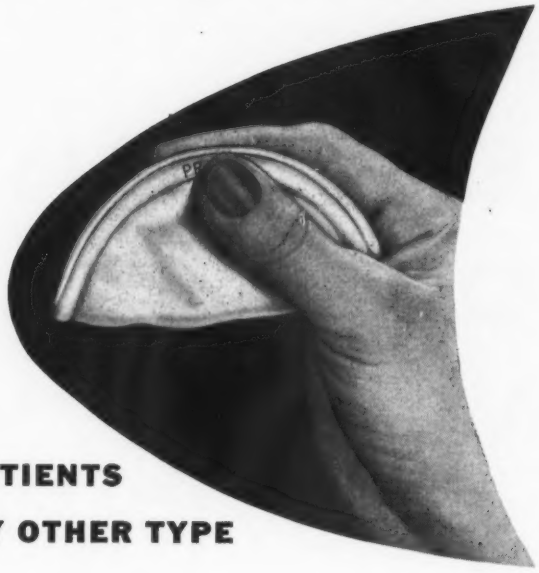
DOCTOR, IT'S A FACT!

Koro-Flex
TRADE MARK

improved

THE DIAPHRAGM WITH THE

CONTOURING COIL SPRING



OFFERS YOU AND YOUR PATIENTS

MORE BENEFITS THAN ANY OTHER TYPE

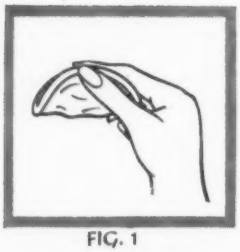


FIG. 1

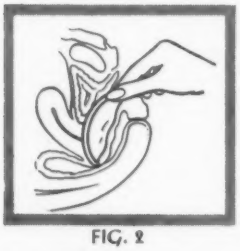


FIG. 2

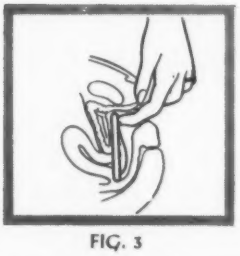


FIG. 3

1. Expressly designed to assure your patient ease of insertion and automatic placement.
2. Conserves physician's time by reducing fitting and instruction period.
3. Patients learn faster and develop greater confidence because of the ease with which they learn to place and use the diaphragm.
4. Affords greater patient protection by locking in spermicidal lubricant and delivering it directly under and next to the os uteri.
5. Folds behind pubic bone with suction-like action forming a more effective barrier.
6. Simple to remove.

When compressed, diaphragm forms into semi-curve or half-moon shape (Fig. 1) permitting it to pass easily along floor of the vagina beyond cervix (Fig. 2) without any difficulty. No mechanical inserter or introducer is required (Fig. 2) since the KORO-FLEX will not buckle or butterfly in form.

KORO-FLEX (contouring) Diaphragm is ideal, not only where ordinary coilspring diaphragms are indicated but for Flat rim (Mensinga) type as well.

May be used in cases of mild prolapse, cystocele or rectocele.

Suggest the convenient-economical KORO-FLEX COMPACT 60-95 mm
Sanitary plastic bag with zipper closure. Diaphragm, tube KOROMEX Jelly (3 oz.), Cream (1 oz. trial size).

Available at all prescription pharmacies. Write for descriptive literature.

HOLLAND-RANTOS COMPANY, 145 HUDSON STREET, NEW YORK 13, N. Y.

SEARLE *announces...*

a superior psychochemical
for the management of both
minor and major
emotional disturbances

Dartal T.M.

dihydrochloride — brand of thiopropazate dihydrochloride

- more effective than most potent tranquilizers
- as well tolerated as the milder agents
- consistent in effects as few tranquilizers are

Dartal is a unique development of Searle Research, proved under everyday conditions of office practice

It is a single chemical substance, thoroughly tested and found particularly suited in the management of a wide range of conditions including psychotic, psychoneurotic and psychosomatic disturbances.

Dartal is useful whenever the physician wants to ameliorate psychic agitation, whether it is basic or secondary to a systemic condition.

In extensive clinical trial Dartal caused no dangerous toxic reactions. Drowsiness and dizziness were the principal side effects reported by non-psychotic patients, but in almost all instances these were mild and caused no problem.

Specifically, the usefulness of Dartal has been established in psychoneuroses with emotional hyperactivity, in diseases with strong psychic overtones such as ulcerative colitis, peptic ulcer and in certain frank and senile psychoses.

Usual Dosage • In psychoneuroses with anxiety and tension states *one 5 mg. tablet t.i.d.*

• In psychotic conditions *one 10 mg. tablet t.i.d.*

ASYMPTOMATIC ALERT
FOR 8-12 HOURS ON A SINGLE TABLET

NEW SUSTAINED ACTION

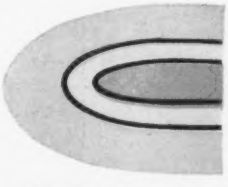
TRIPLE-LAYER TABLET

Keeps patients *asymptomatic* and *alert* up to 12 hours with one tablet

GROUP 4 HIGH POTENCY LOW SEDATION *antihistamine*

"THERUHISTIN"®-S.A.

Brand of Isothipendyl hydrochloride



4-mg. starter dose (rapid release for rapid, initial control)
2-mg. booster dose (provides continuing therapeutic levels)
6-mg. follow-up dose (slow release for sustained, prolonged relief)

"Twelve hours was the duration of action [of one tablet] in over 90 per cent of a series of 125 patients treated with 'THERUHISTIN'-S.A."[1]

The Group 4 features of "THERUHISTIN"— high potency/low sedation—have been established in recent trials involving 602 patients.[2] Effective results were obtained in 92 per cent of the cases and drowsiness was reported in only 0.8 per cent—or only 1 out of every 100 patients.

DOSAGE: "THERUHISTIN"-S.A.—1 tablet on arising; repeat every 8-12 hours as necessary. **SUPPLIED:** "THERUHISTIN"-S.A. Tablets, 12 mg., bottles of 100 and 1,000.

ALSO AVAILABLE: "THERUHISTIN" Tablets, 4 mg., bottles of 100 and 1,000. "THERUHISTIN" Syrup, 2 mg. per 5 cc. (tsp.), bottles of 16 fluidounces.

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1. Spielman, A. D.: Personal communication. 2. New and Unused Therapeutics Committee, Am. Coll. Allergists: Interim Report at Thirteenth Annual Congress, Mar. 20-22, 1957, Chicago, Ill., Ann. Allergy, to be published.

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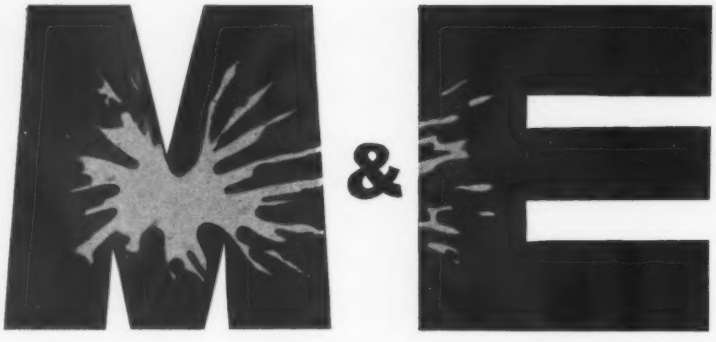

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1. **Brooks, L. H.: Use of Malt Soup Extract in Treatment of Pruritus Ani (American Proctologic Society, April, 1957. To be published.)**

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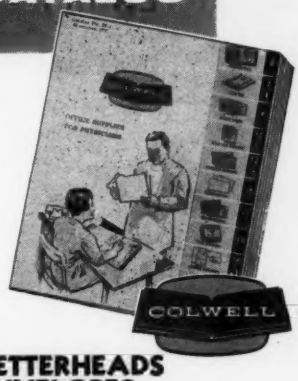

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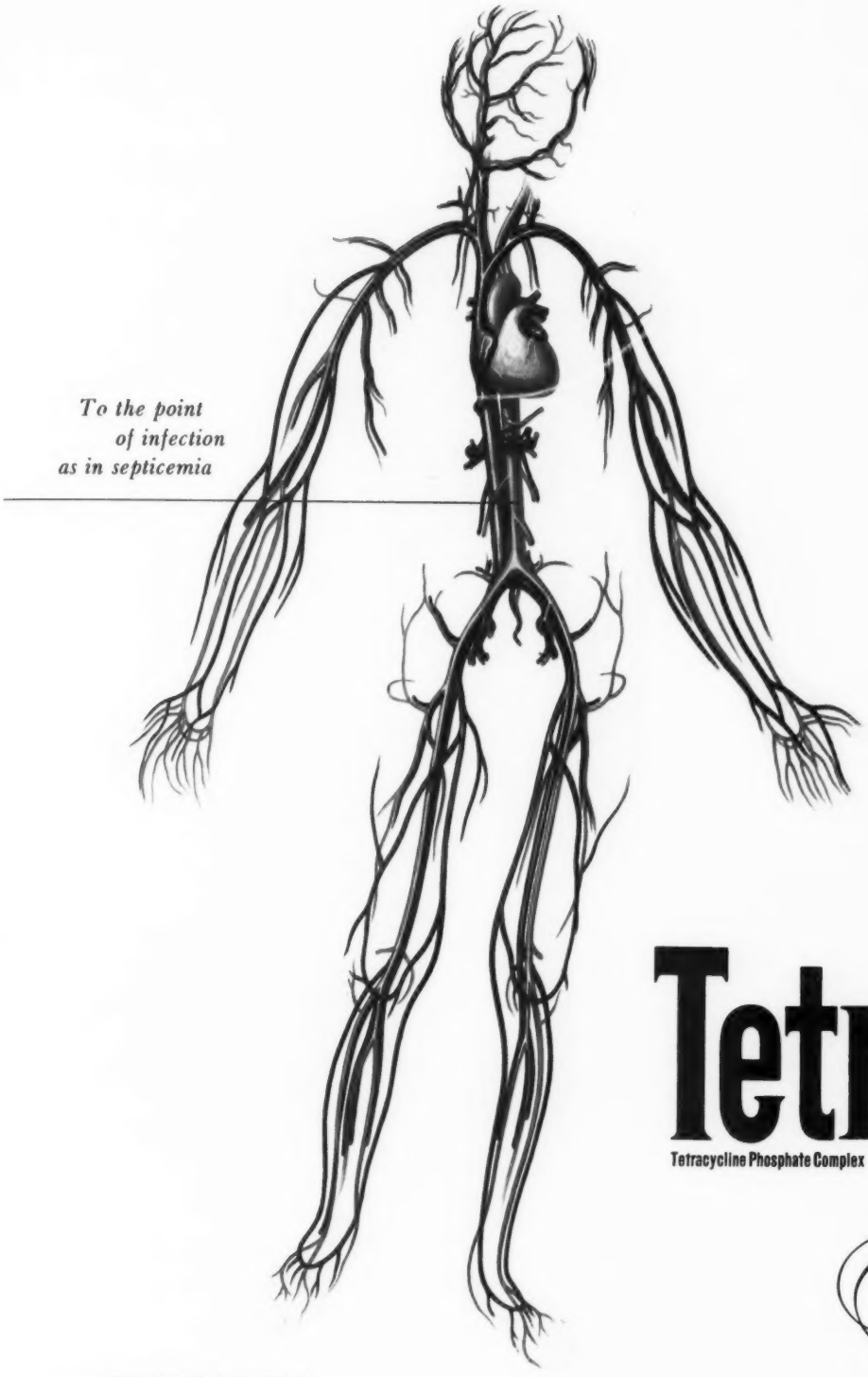

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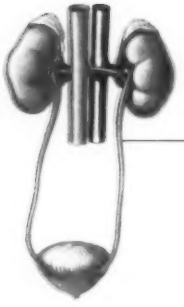

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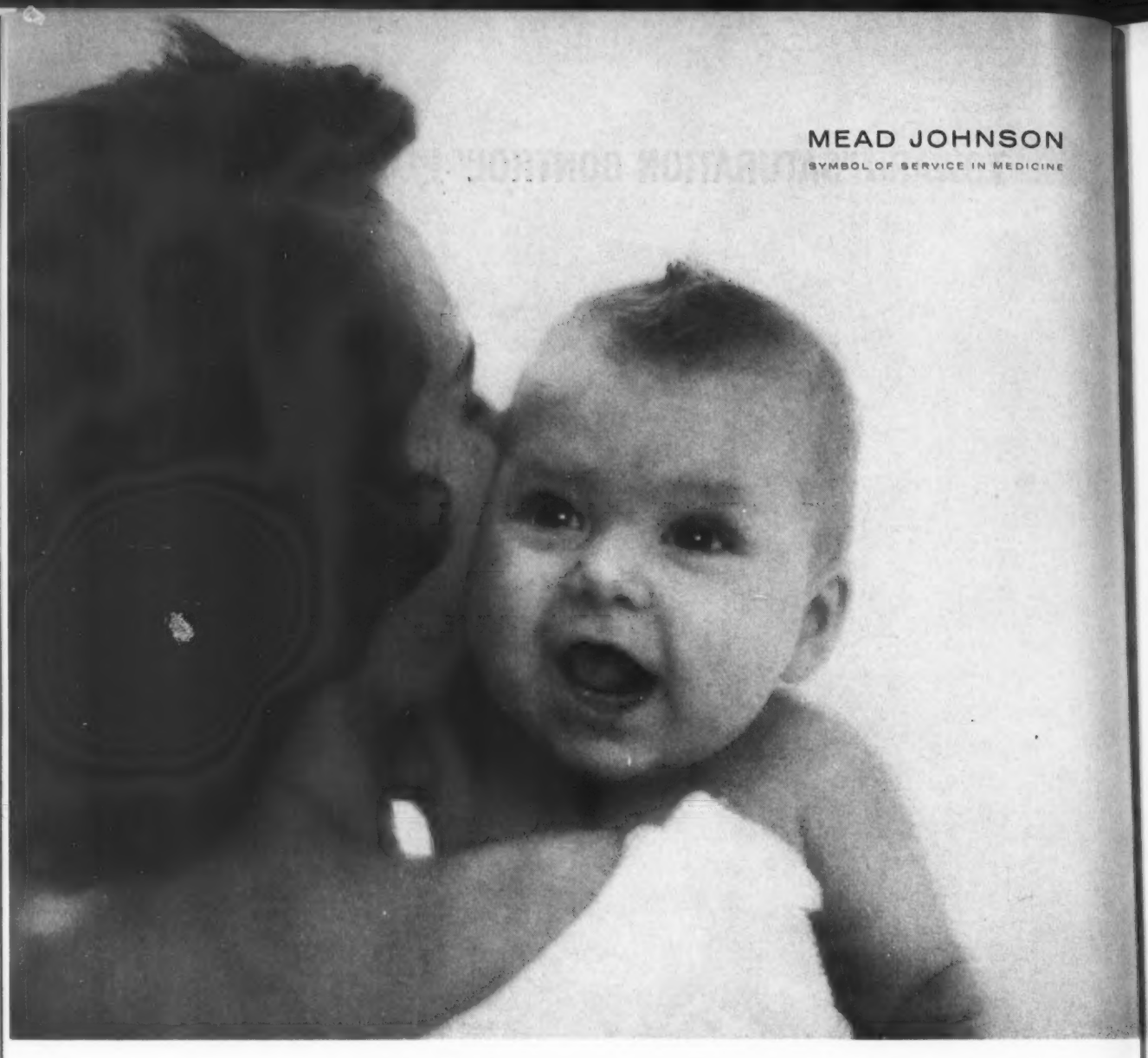

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1. Van Gasse, J. J., and Miller, R. F.: Current Concepts on the Etiology and Management of Atherosclerosis, Scientific Exhibit, American Medical Association Meeting, New York, June 3-5, 1957.

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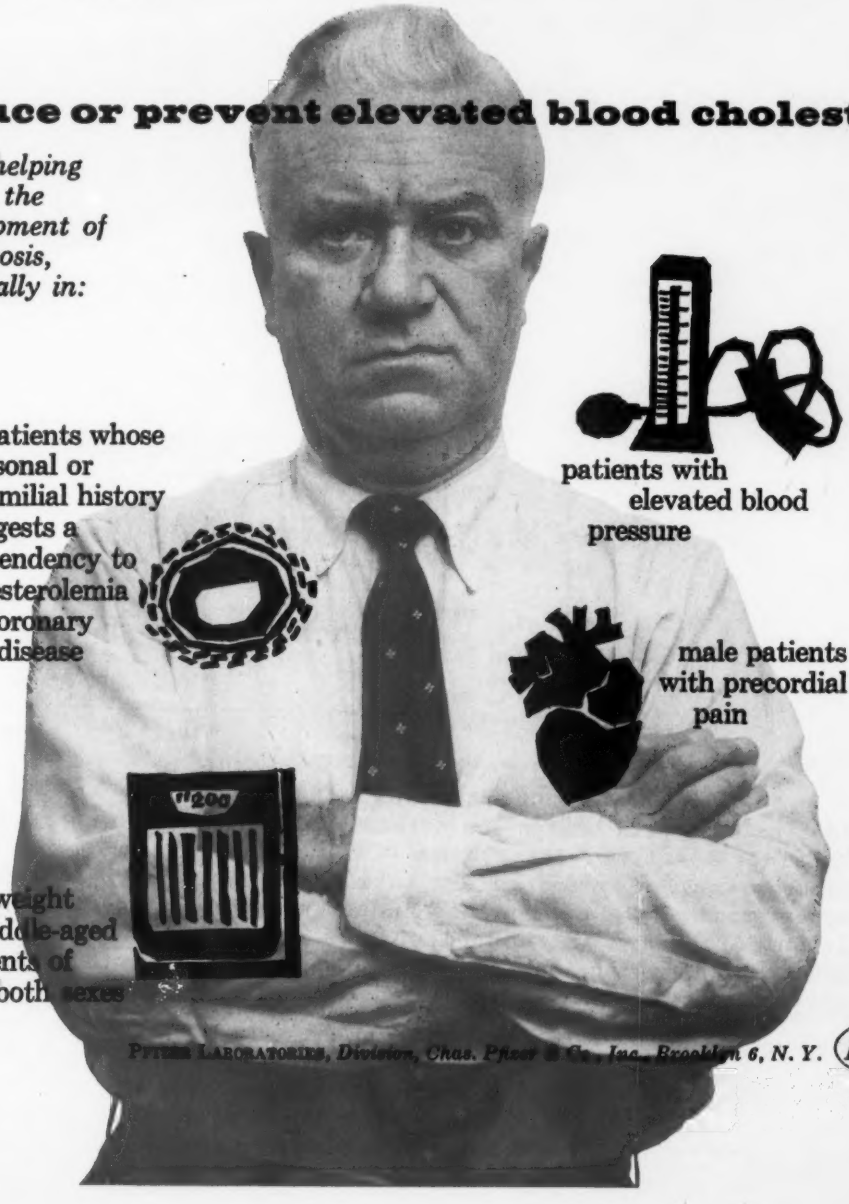
thereby helping to minimize the development of atherosclerosis, especially in:



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patients with elevated blood pressure

male patients with precordial pain

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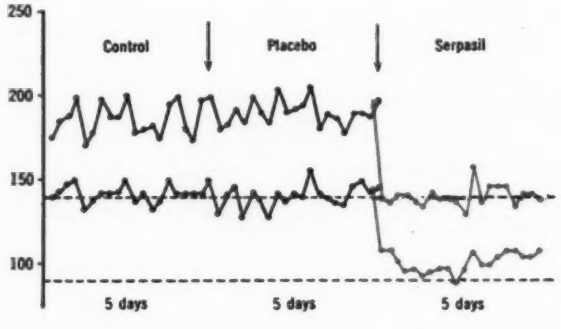

* Chart shows actual response to Serpasil in a patient with benign essential hypertension (data on request). Consider Serpasil® (reserpine CIBA) (1) alone to lower blood pressure gradually and safely in most cases of mild to moderate hypertension; (2) as a primer in severe hypertension before more potent drugs are introduced; (3) as a background agent in all grades of hypertension to permit lower dosage and thus minimize side effects of other antihypertensives.

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References: (1) Stein, I. D.: Circulation 12:833, 1955. (2) Potvin, L.: Bull. Assoc. méd. lang. franç. Canada 85:941, 1956. (3) Sigg, K.: Angiology 8:44, 1957. (4) Elder, H. H. A., and Armstrong, J. B.: Practitioner 178:479, 1957. (5) Braden, F. R.; Collins, C. G., and Sewell, J. W.: J. Louisiana M. Soc. 109:372, 1957.

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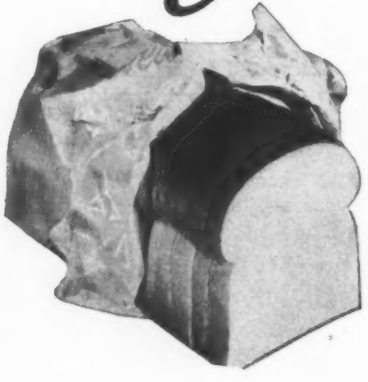

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**Joseph, Morris: Effective Analgesia Without Sedation or Narcosis, Clinical Medicine, August 1957*

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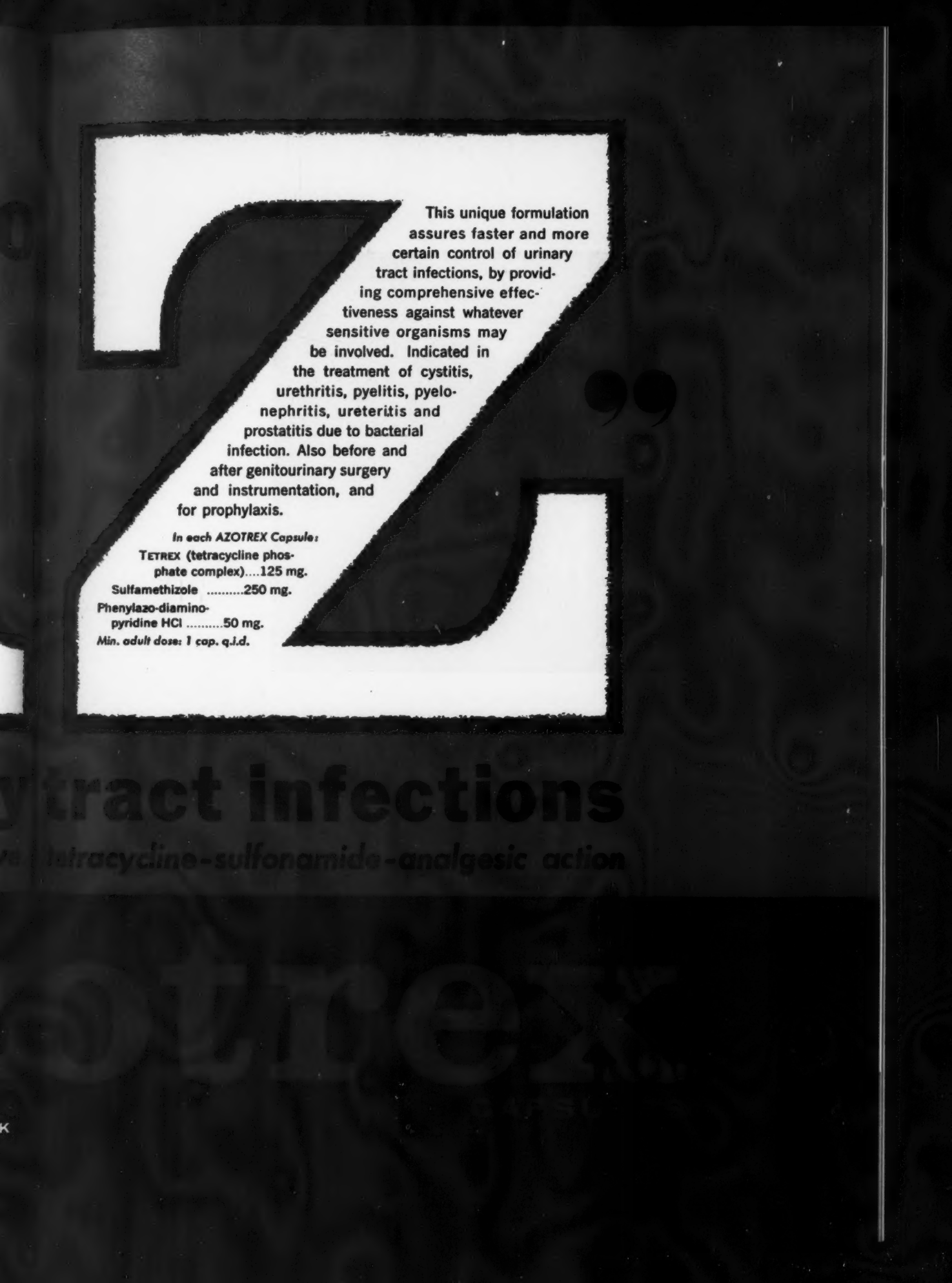
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tract infections
tetracycline-sulfonamide-analgesic action

in urinary tract infections
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CONCLUSIONS: "FURADANTIN, in doses up to 100 mg. q.i.d. for a period of 7 days, is an effective and safe antibacterial chemotherapeutic agent for urinary tract infections. Pregnancy does not contraindicate its use."

FURADANTIN *effective and safe in pregnancy* [1,2,3]

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SUPPLIED: Tablets, 50 and 100 mg., bottles of 25 and 100.
Oral Suspension, 25 mg. per 5 cc. tsp., bottle of 60 cc.
(Readily miscible with water, milk or fruit juices.)

REFERENCES: 1. Nesbitt, R. E. L., Jr., and Young, J. E.: Obst. Gyn., N. Y. 10:89, 1957. 2. Diggs, E. S.; Prevost, E. C., and Valderas, J. G.: Am. J. Obst. 71:399, 1956. 3. MacLeod, P. F.; Rogers, G. S., and Anzlowar, B. R.: Internat. Rec. Med. 169:561, 1956.

NOW, for hospitalized patients, for severe urinary tract infections when peroral administration of FURADANTIN is not feasible and for serious infections as septicemia (bacteremia) when the bacterium is sensitive:
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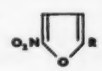
neither antibiotics nor sulfonamides



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Pyridoxine HCl (B_6)	2 mg.
Vitamin E (as tocopheryl acetates)	5 I. U.
Vitamin K (Menadione)	2 mg.
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Calcium Pantothenate	5 mg.
Niacinamide	100 mg.
Folic Acid	1 mg.
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l-Lysine Monohydrochloride	25 mg.
Rutin	25 mg.
Purified Intrinsic Factor Concentrate	0.5 mg.

DOSAGE: 1 capsule daily for the treatment of vitamin and mineral deficiencies, or more as indicated.

SUPPLIED: Bottles of 100 capsules.

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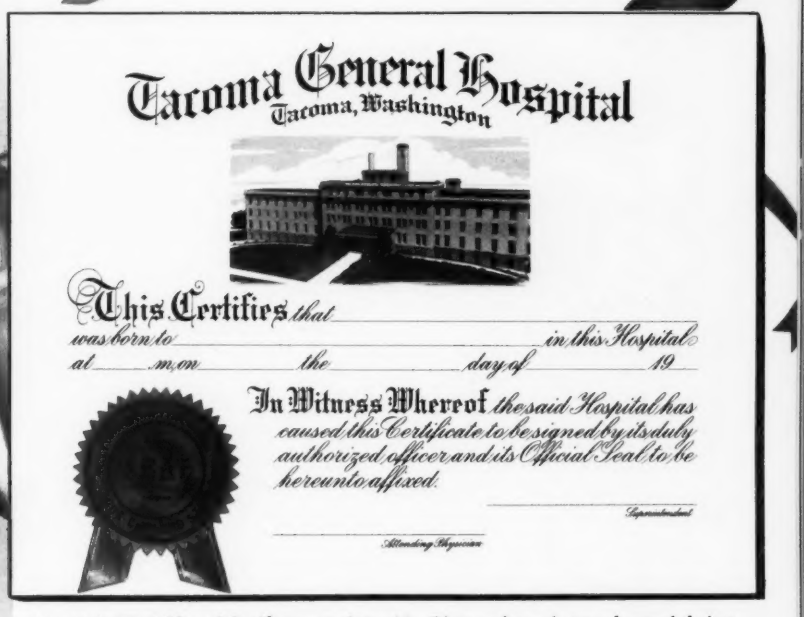
Tacoma General Hospital
Tacoma, Washington
This Certifies that
was born to
in this Hospital
at m. on the day of 19
In Witness Whereof the said Hospital has caused this Certificate to be signed by its duly authorized officer and its Official Seal to be hereunto affixed.
Superintendent
Attending Physician

New Style FX *Ribboned* Certificate complete with ribbon under seal, one of several designs.

SATIN RIBBONED Birth Certificates

Want to see something beautiful — something entirely new for building goodwill among new parents, their relatives and friends? Then write for the exciting completely new '58 Portfolio of Hollister *Inscribed* Birth Certificates. Twenty-eight pages of information, pictures, prices and new designs. Contains actual samples of the new *ribboned* Certificates and a generous variety of sample Certificates with standard seals. When you receive your portfolio, notice the effectiveness of the additional note of color in the ribboned Certificates. Consider what a thrill you'll give the new parents when you present this heirloom quality token of your interest and goodwill. And remember . . . your gift of any Hollister Certificate makes a big impression and a lasting one for very little money. A letter or postcard will bring this Deluxe '58 Portfolio promptly. Write for it.

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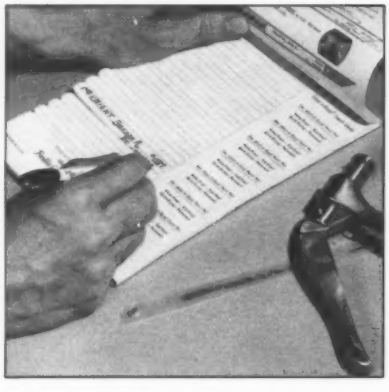
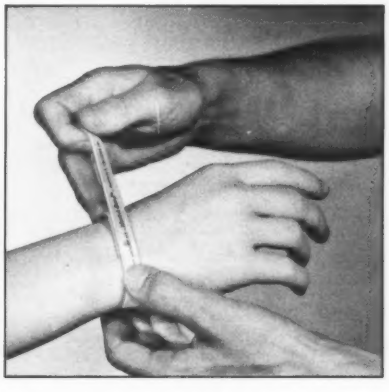
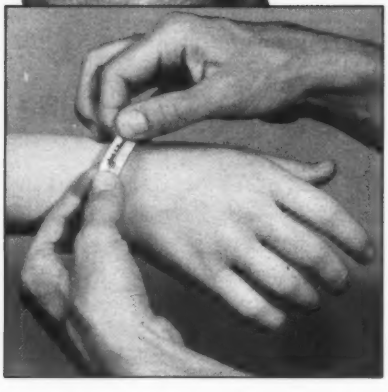
Demonstration shows how you can avoid identification worry



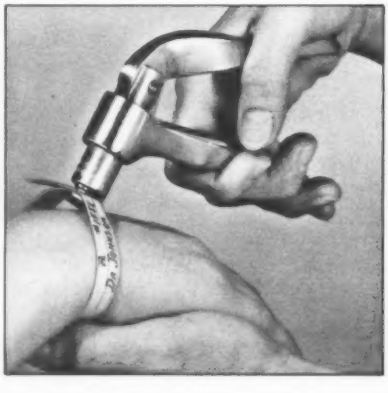
1 YOU WON'T WORRY, once you provide Ident-A-Band on-the-wrist protection for your patients. And when you see how everything in the system is planned to make it easy, you'll really rejoice. Ident-A-Band insert cards, for example, provide generous room for all data.



2 WITH IDENT-A-BAND there's no need to apply a band that's just a little too tight for comfort or a little too loose for security. The wrist is measured with the band itself (see above). Then punch hole, clip off surplus band, insert card and band's ready for fastening. All in seconds!



3 EASY FASTENING! The metal seal is made up with the band in manufacture so that it's already in place – ready to go through the hole you punched. Very slight finger pressure does it. That's all there is to it. And the band is in place ready for sealing—all data inside the band.



4 SEALING INSTRUMENT makes "custom fitting" quick and easy. A gentle squeeze and the seal is locked permanently. Easy as using a hemostat! Smooth metal seal is rivet strong. **Ident-A-Band is the *one* system that provides positively *sealed-on* protection.**

5 A QUICK TRIM and Ident-A-Band is ready to protect against misidentification for days, weeks, even months. Light weight. Comfortable. (The skin-soft Vinylite band is Mylar-reinforced for strength.) Even the chubby newborn wrist, which requires a snug fit, is no problem.

6 BE SURE that your system of patient identification gives the positive *permanently sealed-in* protection that really FREES you from worry about possible mixups. Send a postcard or letter now for samples of Ident-A-Band—**the system that *rivet-seals* all identifying data inside.**

Ident-A-Band® prevents mixups

HOLLISTER® FRANKLIN C. HOLLISTER CO., 833 N. Orleans St., Chicago 10, Ill.

what are the differences among tranquilizers ?

Reviews of ataraxic therapy commonly divide the available tranquilizers into three main categories: the rauwolfia derivatives; the phenothiazine compounds; and a smaller group of agents which are lumped together for the sake of convenience rather than because of any common characteristic.

As a result, one significant fact is often overlooked: ATARAX (hydroxyzine) does not fit into any of these three categories. Indeed, by any logical criterion, it belongs in a class by itself.

1. ATARAX is chemically unique. It differs from any other tranquilizer now available, not in minor molecular rearrangements but in basic structure.

2. ATARAX is therapeutically different. ATARAX is characterized by unique cerebral specificity. On ATARAX, the patient retains full consciousness of incoming stimuli —their nature and their intensity—but his reactions are those of a well-adjusted person. He is neither depressed nor torpid, and his reflexes remain normal, as does cortical function. Thus ATARAX induces a calming peace-of-mind effect without disturbing mental alertness.

3. ATARAX is, perhaps, the safest ataraxic known. It is outstandingly well tolerated. Every clinical report confirms this fact.* After more than 150 million doses, there has not been a single report of toxicity, blood dyscrasia, parkinsonian effect, liver damage, or habituation.

4. ATARAX is unusually flexible. This lack of toxicity makes it possible to adjust ATARAX dosage to virtually any patient need. In the lowest range, children respond well to 10 mg. or one teaspoonful of syrup t.i.d., while anxious adults usually are treated with 25 mg. q.i.d. Yet, if needed, the dosage can safely be raised: in more severe disturbances, dosages up to 1,000 mg. daily have been administered without adverse reactions.

In reviewing your own experience with tranquilizers, remember that ATARAX is in a class by itself; that you cannot judge it by your results with any other drug. To get to know ATARAX at first hand, prescribe it for the next four weeks whenever a tranquilizer is indicated. See for yourself how it compares.

*Documentation on request

PEACE OF MIND ATARAX®
(BRAND OF HYDROXYZINE)

ATARAX
in any hyperemotive state

for childhood behavior disorders
10 mg. tablets—3-6 years, one tablet t.i.d.; over 6 years, two tablets t.i.d. Syrup—3-6 years, one tsp. t.i.d.; over 6 years, two tsp. t.i.d.

for adult tension and anxiety
25 mg. tablets—one tablet q.i.d. Syrup—one tbsp. q.i.d.

for severe emotional disturbances
100 mg. tablets—one tablet t.i.d.

for adult psychiatric and emotional emergencies
Parenteral Solution—25-50 mg. (1-2 cc.) intramuscularly, 3-4 times daily, at 4-hour intervals. Dosage for children under 12 not established.

Supplied: Tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution, 10 cc. multiple-dose vials.

M. A. Sidlee M.D.
Medical Director

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Division, Chas. Pfizer & Co., Inc.

...for adequate preparation prior to proctosigmoidoscopy[1]

FLEET® ENEMA

Disposable Unit

also for pre- and post operative cleansing, and as an effective routine enema in hospital or home

Anatomically correct rectal tube[2] extends just past the internal anal sphincter, minimizes injury hazard. Each unit contains, per 100 cc., 16 Gm. Sodium Biphosphate and 6 Gm. Sodium Phosphate in hand-size ready-to-use plastic squeeze bottle with pre-lubricated tip.

1. Crumpacker, E. L., et al., AMA Arch. Int. Med., 98:314.
2. Palmer, E. D., "Clinical Gastroenterology" Hoeber-Harper.

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OIL RETENTION ENEMA (FLEET)®

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an oxazine . . . not an amphetamine

appetite curbed . . .

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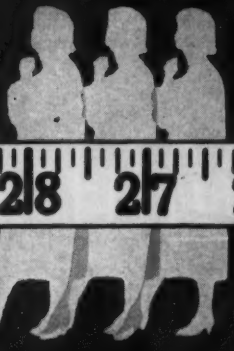

PRELUDIN®

(brand of phenmetrazine hydrochloride)

developed specifically

for appetite suppression

Chemically different from the amphetamines, PRELUDIN provides potent appetite suppression with little or no central stimulation.

- **rarely causes loss of sleep**[1] — may be given late enough in the day to curtail after-dinner "nibbling," yet not hinder sleep.
- **avoids nervous tension and "jitters"**[2] — simultaneous sedation is not required.[3]

"...in clinical use the side-effects of nervousness, hyperexcitability, euphoria, and insomnia are much less than with the amphetamine compounds and rarely cause difficulty."[4]

References: (1) Gelvin, E. P.; McGavack, T. H., and Kenigsberg, S.: Am. J. Digest. Dis. 7:155, 1956. (2) Holt, J. O. S., Jr.: Dallas M. J. 42:497, 1956. (3) Natenshon, A. L.: Am. Pract. & Digest Treat. 7:1456, 1956. (4) Council on Pharmacy and Chemistry, New and Nonofficial Remedies: J.A.M.A. 163:356 (Feb. 2) 1957.

PRELUDIN® (brand of phenmetrazine hydrochloride). Scored, square, pink tablets of 25 mg. Under license from C. H. Boehringer Sohn, Ingelheim.

GEIGY Ardsley, New York

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Insure Vitamin and Mineral Sufficiency During Pregnancy and Lactation

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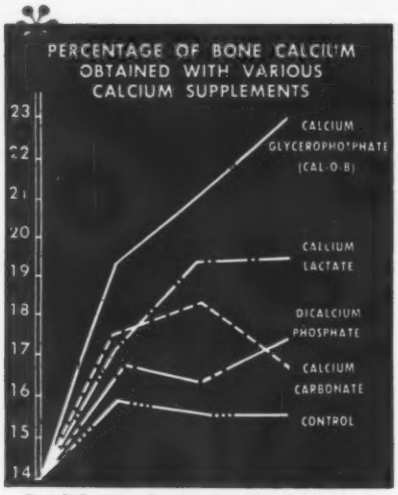
CAL-O-B TABLETS

for bone health *

because phosphorus IS essential ---
because phosphorus and calcium MUST be assimilable



Proof! Results of a closely controlled laboratory study. Diet of all animals identical, except type of calcium supplement. Bones dried and de-fatted before assay.

A definite advancement over phosphorus-free supplements. CAL-O-B Tablets supply essential phosphorus, calcium, Vitamin D_2, iron and trace minerals, for better bone health. Calcium, as glycerophosphate, is utilized as shown at left to produce greater deposition in bone than any of the commonly used phosphated or phosphorus-free compounds. Why? . . . because Cal-O-B calcium is completely soluble and assimilable throughout the entire pH range of G-I tract.

. . . and CAL-O-B Tablets relieve leg cramps!

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For the first time ...

YOU CAN TURN OFF THE COUGH UNTIL MORNING

TUSSIONEX™

A 'Strasionic' Release Product • Dihydrocodeinone Resin—Phenyltoloxamine Resin

8-12 HOUR CONTROL WITH A SINGLE DOSE

through sustained 'Strasionic' release.

Suppresses nighttime sleep-robbing, daytime distracting, useless coughs without interfering with the protective cough mechanism.[1]

Over 12,000 clinical observations [1,2,3,4] demonstrate its wide field of usefulness in ages ranging from 3 months to more than 70 years.

REFERENCES

(1) Chan, Y. T. and Hays, L. E., The American Journal of the Medical Sciences, August, 1957. (2) Townsend, E. H., Jr. In Press. (3) Weismiller, F., In Press. (4) Cass, Leo J. and Frederik, W. S., In Press.

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EACH TUSSIONEX TABLET CONTAINS:
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EACH TEASPOON (5cc.) TUSSIONEX LIQUID CONTAINS:
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SUGGESTED DOSE
One tablet or teaspoon (5cc.) q12h
Rx only. Class B taxable narcotic

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R. J. STRASENBURGH CO., ROCHESTER, N. Y., U.S.A.

key to oral penicillin effectiveness

V-CILLIN K

(Penicillin V Potassium, Lilly)

stability plus solubility provides greater absorption

—twice as much absorption of penicillin as from buffered potassium penicillin G given orally.

A greater total penicillemia is produced by 250 mg. of 'V-Cillin K' t.i.d. than by 600,000 units daily of intramuscular procaine penicillin G. Also, high serum levels are attained more quickly with this new oral penicillin.

These unique advantages of 'V-Cillin K' assure maximum penicillin effectiveness, and dependable therapy, for penicillin-sensitive infections.

Scored tablets of 125 and 250 mg. (200,000 and 400,000 units).

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Conventions and meetings

Announcements

American Osteopathic Association, Sixty-Second Annual Convention, Sheraton-Park and Shoreham Hotels, Washington, D.C., July 14-18. Program Chairman, Richard O. Brennan, 1115 W. Alabama St., Houston 6, Tex.

American College of Osteopathic Internists, annual meeting, Waldorf-Astoria Hotel, New York City, October 2-4. Program Chairman, H. Earle Beasley, 189 Bay State Rd., Boston 15, Mass. Secretary, Glennard E. Lahrson, 460 Staten Ave., Oakland 10, Calif. Western Division, annual meeting, Ambassador Hotel, Los Angeles, February 22-23. Program Chairman, S. J. Aquila, 5622 Van Nuys Blvd., Van Nuys, Calif.

American College of Osteopathic Obstetricians and Gynecologists, annual meeting, Denver, February 9-12. Secretary, Arthur A. Speir, Box 66, Merrill, Mich.

American College of Osteopathic Surgeons, annual meeting, Statler Hotel, Boston, October 26-30. Executive Secretary, Mrs. E. F. Martin, Box 474, Coral Gables 34, Fla.

American Osteopathic Academy of Orthopedics, annual meeting, Statler Hotel, Boston, October 26-30. Secretary, J. Paul Leonard, 2673 W. Grand Blvd., Detroit 8, Mich.

American Osteopathic College of Anesthesiologists, annual meeting, Statler Hotel, Boston, October 26-30. Secretary, Crawford M. Esterline, Box 155, Kirksville, Mo.

American Osteopathic College of Radiology, annual meeting, Statler Hotel, Boston, October 26-30. Secretary, F. A. Turfler, Jr., South Bend Osteopathic Hospital, 2515 E. Jefferson Blvd., South Bend 15, Ind.

American Osteopathic Hospital Association, annual meeting, Statler Hotel, Boston, October 26-30. Executive Secretary, Mr. R. P. Chapman, 4000 Brady St., Davenport, Iowa.

Arizona, annual meeting, El Dorado Hotel, Tucson, May 4-6. Program Chairman, James B. Carson, 2813 S. Sixth Ave., Tucson. Executive Secretary, Mrs. Laura McRae, 4122 N. 19th Dr., Phoenix.

One tablet q. 12 h.: to prevent angina pectoris

Provides full 24-hour protection for 8 out of 10 angina patients: In rigorous clinical trials,[1] METAMINE SUSTAINED improved 80 (78%) of 103 patients with angina pectoris, including a group refractory to other medication.

Each METAMINE SUSTAINED tablet slowly releases 10 mg. of METAMINE, the unique, amino nitrate, to provide lasting, 12-hour protection from attacks of angina pectoris.

Simplified dosage—just 1 tablet on arising, and 1 before the evening meal.

Greater economy for your patient with angina pectoris.

Supplied: METAMINE SUSTAINED, 10 mg., bottles of 50 sustained-release tablets. Also available: METAMINE, 2 mg., in bottles of 50 and 500, and METAMINE (2 mg.) with BUTABARBITAL (¼ gr.), bottles of 50 tablets.

[1]Fuller, H. L. and Kassel, L. E.: Antibiotic Medicine and Clinical Therapy, 3:322, October 1956.

1 tablet all day
1 tablet all night

Metamine®
triethanolamine trinitrate biphosphate, LEEMING, 10 mg.
Sustained

Thos. Leeming & Co. Inc. 155 E. 44th St., NEW YORK 17, N.Y.

California, annual meeting, Senator Hotel, Sacramento, May 14-18. Program Chairman, Richard E. Eby, 1247 N. Park Ave., Pomona. Executive Secretary, Mr. Thomas C. Schumacher, 1298 Wilshire Blvd., Los Angeles 17.

Colorado, annual meeting, Denver, May 3. Program Chairman, A. Hollis Wolf, 304 Carlton Bldg., Colorado Springs. Secretary, C. Robert Starks, 1459 Ogden St., Denver 18.

Eastern States Osteopathic Society of Proctology, annual meeting, Hotel DuPont, Wilmington, Del., November 1-2. Program Chairman, Terrell E. Cobb, 1379 Narragansett Blvd., Cranston 5, R.I. Secretary, LeRoy W. Lovelidge, Jr., 201 E. Orange St., Lancaster, Pa.

Georgia, annual meeting, Dinkler-Plaza Hotel, Atlanta, May 12-14. Program Chairman, Charles B. Wright, Tucker Hospital, Tucker. Executive Secretary, Mr. James C. Chappell, 3900 Bobolink Dr., Decatur.

Illinois, annual meeting, Palmer House, Chicago, April 24-26. Executive Secretary, Mr. Douglas O. Durkin, Room 521, 53 W. Jackson Blvd., Chicago 4.

Indiana, annual meeting, French Lick-Sheraton Hotel, French Lick, May 18-20. Program Chairman, Harold T.

"*Functional vomiting* should be carefully distinguished from organic vomiting. Grave consequences may follow if evidences of organic derangement . . . are masked by treatment designed to control vomiting alone."[1]

SAFE

Safety First | in emesis therapy

Prescribe

EMETROL®

(Phosphorated Carbohydrate Solution) *First*

SAFE

EMETROL will not suppress symptoms arising from organic etiology. It controls vomiting of functional origin quickly.

Dosage: Adults, 1 or 2 tablespoonfuls; infants and children, 1 or 2 teaspoonfuls, as often as every 15 minutes. Always administer *undiluted,* and forbid oral fluids for at least 15 minutes after each dose. Even if first dose is not retained, continue administration. If vomiting is not controlled within one or two hours, look for organic etiology. For individual dosage regimens in various indications, please send for literature.

1. Bradley, J. E.: Mod. Med. 20:71, No. 20, 1952.

Kinney KINNEY & COMPANY, INC. Columbus, Indiana

Sparks, 2317 Washington Ave., Evansville 14. Secretary, Arabelle Baker Wolf, 4840 N. Michigan Rd., Indianapolis 8.

Iowa, annual meeting, Hotel Savery, Des Moines, May 25-27. Program Chairman, George W. Sutton, 511 E. Washington, Mount Pleasant. Secretary, Mr. Herman W. Walter, 200 Walnut Bldg., Des Moines 9.

Louisiana, annual meeting, Lake Charles, October 23-25. Secretary, V. L. Wharton, 406-07 Weber Bldg., Lake Charles.

Maine, annual meeting, Samoset Hotel, Rockland, June 26-28. Program Chairman, Robert J. Meehan, 223 Main St., Rockland. Executive Secretary, Mr. George R. Petty, Monmouth.

Massachusetts, annual meeting, Somerset Hotel, Boston, January 18-19. Executive Secretary, Mrs. Gladys M. Stockdale, 524 California St., Newtonville 60.

Michigan, annual meeting, Civic Auditorium, Grand Rapids, October 6-8. Program Chairman, Emmett Binkert, Carson City Hospital, Carson City. Executive Secretary, Mr. Floyd E. Brooker, 81 Glendale, Highland Park 3.

Minnesota, annual meeting, Hotel Nicollet, Minneapolis, May 1-3. Program Chairman, Robert M. Plasch, 816 E. 38th St., Minneapolis 7. Secretary, E. R. Komarek, 301 Granite Exchange Bldg., St. Cloud.

New Jersey, annual meeting, Traymore Hotel, Atlantic City, March 8-9. Program Chairman, John D. Dennis, Jr., 46 Glenwood Ave., East Orange. Executive Secretary, Mr. I. J. Tecker, 1007 Pinebrook Rd., Haddonfield.

Northwest Osteopathic Convention, Olympic Hotel, Seattle, June 12-14. Program Chairman, Wilbert B. Saunders, 4730 University Way, Seattle 5.

Ohio, annual meeting, Neil House, Columbus, May 4-7. Program Chairman, A. R. Fuller, 201 S. Park Ave., Fremont. Executive Secretary, Mr. William S. Konold, 53 W. Third Ave., Columbus 1.

Ontario, annual meeting, Windsor, May 1-3. Program Chairman, Norman W. Routledge, 15, Ursuline Ave., Chatham. Secretary, A. V. DeJardine, 205 Yonge St., Toronto 1.

Oregon: See Northwest Osteopathic Convention.

Rhode Island, annual meeting, March 5-6. Program Chairman, J. Weston Abar, 981 Narragansett Blvd., Providence 5.

Society of Divisional Secretaries, midyear meeting, A.O.A. Central Office, Chicago, January 25-26. Program Chairman, Arabelle Baker Wolf, 809-13 Odd Fellows Bldg., Indianapolis 4. Secretary, Mr. Paul D. Adams, 325 E. McCarty St., Jefferson City, Mo.

South Dakota, annual meeting, Drake Hotel, Watertown, June 1-2. Program Chairman, Lawrence L. Massa, 981 E. Main St., Sturgis. Secretary, Earl W. Hewlett, 417 W. 27th St., Sioux Falls.

Tennessee, annual meeting, Maxwell House, Nashville, April 27-30. Program Chairman, William H. Graves, Central Bldg., Bristol. Secretary, J. M. Moore, Jr., 200 High St., Trenton.

Vermont, annual meeting, Green Mountain Inn, Stowe, September 23-25. Clerk-treasurer, Marian N. Rice, 8 Court St., Windsor.

Virginia, annual meeting, Williamsburg Lodge, Williamsburg, May 22-24. Program Chairman, Felix D. Swope, 126 N. Columbus St., Alexandria. Secretary, John A. Cifala, 2778 N. Washington Blvd., Arlington.

Washington: See Northwest Osteopathic Convention.

West Virginia, annual meeting, Daniel Boone Hotel, Charleston, May 18-20. Program Chairman, Earl K. Lyons, Professional Bldg., Kerens Ave., Elkins. Secretary, Guy E. Morris, 542 Empire Bank Bldg., Clarksburg.

Wisconsin, annual meeting, Wisconsin Hotel, Milwaukee, April 28-30. Program Chairman, Donald R. Bartingale, 403 S. Farwell St., Eau Claire. Secretary, Edwin J. Elton, 1518 N. 70th St., Wauwatosa 13.

State and national boards

ARIZONA

Those interested in professional examinations should contact Russell Peterson, D.O., secretary, Osteopathic Board of Registration and Examination in Medicine and Surgery, 2747 East McDowell Rd., Phoenix.

Officers of the Board are: President, L. A. Nowlin; vice president, Richard O. McGill; and secretary-treasurer, Russell Peterson, all of Phoenix. New appointments to the Board include Homer E. Allshouse, Phoenix, and Thomas J. Odom and Mr. Stanley Norman Schultz, both of Tucson.

Basic science examinations March 18 at the University of Arizona, Tucson. Applications must be filed 2 weeks prior to examinations. Address Mr. Herman E. Bateman, secretary, Basic Science Board, University of Arizona, Tucson.

CALIFORNIA

Russell M. Husted, Long Beach, has been elected president of the Board of Osteopathic Examiners. Vincent P. Carroll, Laguna Beach, is vice president, and Glen D. Cayler, Los Angeles, was reelected secretary-treasurer.

COLORADO

Basic science examinations March 5-6 at second floor lecture room, Y.M.C.A. Building, E. 16th Ave. and Lincoln St., Denver. Applications must be filed by February 19. Address Esther B. Starks, D.O., secretary, Basic Science Board, 1459 Ogden St., Denver 18.

CONNECTICUT

Examinations March 11-12. Applications must be filed by February 25. Address Frank Poglitsch, D.O., secretary, Osteopathic Examining Board, 300 Main St., New Britain.

Basic science examinations February 8. Applications must be filed 2 weeks prior to examinations. Address Herbert S. Harned, Jr., M.D., secretary, Board of Healing Arts, 110 Whitney Ave., New Haven 10.

DISTRICT OF COLUMBIA

Basic science examinations in April at 1740 Massachusetts Ave., N.W., Washington 6, D.C. Address Daniel Leo Finucane, M.D., secretary, Commission on Licensure, 1740 Massachusetts Ave., N.W., Washington 6, D.C.

HAWAII

Examination dates by Territorial Law are usually held the first Wednesday, Thursday, and Friday of January, April, July, and October. One of these dates is set for examination after approval of the candidate's application by the Board. Address Frank O. Gladding, D.O., secretary, Board of Osteopathic Examiners, 504 Kauikeolani Bldg., Honolulu 13.

The officers of the Board are: President, Bernice L. Gier; vice president, Isabelle Morelock; and secretary-treasurer, Frank O. Gladding, all of Honolulu. Drs. Gier and Gladding recently were reappointed to the Board.

ILLINOIS

Examinations in January in Chicago. Address Mr. Frederic B. Selcke, Superintendent of Registration, Department of Registration and Education, State House, Springfield.

INDIANA

C. Allen Brink, D.O., Princeton, has been elected treasurer of the Board of Medical Registration and Examination.

IOWA

Basic science examinations April 8 at the Capitol Building, Des Moines. Address Elmer W. Hertel, Ph.D., secretary, Board of Basic Science Examiners, Wartburg College, Waverly.

MAINE

The officers of the Board of Osteopathic Examination and Registration are M. Carman Pettapiece, Portland, chairman, and George F. Noel, Dover-Foxcroft, secretary-treasurer. Drs. Pettapiece, Noel, and Franklin Randolph, Waldoboro, were recently reappointed to the Board. New Board members are Hiram D. Stevens, Smyrna Mills, and Stanley H. Rowe, Gorham.

MICHIGAN

Basic science examinations in February at Detroit and Ann Arbor. Address Mrs. Anne Baker, secretary, Board of Exam-

High-concentration topical salicylate-menthol therapy (BEN-GAY) offers safe, penetrating relief of painful joints and muscles resulting from overexertion.

New, objective evidence:

A double-blind study[1] has reaffirmed the exceptional efficacy and safety of conservative, local treatment of chronic rheumatic disorders with BEN-GAY® (BAUME BENGUÉ), a high-concentration salicylate-menthol compound.

The local and systemic effects of BEN-GAY were evaluated by entirely objective methods in 211 subjects of both sexes suffering from various types of chronic arthritis, bursitis, neuralgia, myalgia and lumbago. Changes in range of joint motion were determined by goniometer and by flexion. Topical application of BEN-GAY measurably improved articular function in 94% when physical therapy was also used, and in 61% without adjunctive treatment. Efficient absorption of salicylate through the skin was indicated by an average urinary excretion of 15 mg. in 24 hours. No ill effects were reported or observed.

Benefits of Topical Salicylate

in chronic rheumatic disease

Menthol-induced hyperemia plus high local concentration of salicylate has been recently rediscovered as one of the safest and most promptly effective remedies for rheumatoid discomfort due to exposure.

This controlled study offers new evidence of the efficacy and safety of local treatment of chronic rheumatic disease with BEN-GAY, one of the safest and most reliable formulae at the physician's disposal. BEN-GAY is available in two strengths, *Regular and Children's*. THOS. LEEMING & CO., INC., 155 East 44th St., New York 17, N.Y.

[1]Brusch, C.A., et al.: Md. State Med. J.; 5:36, 1956.

More efficient salicylate penetration of treated area and quicker relief of pain is now made possible by water-washable, new GREASELESS-STAINLESS BEN-GAY.

weeks?

months?

years?

Improve the prognosis in fractures with "Premarin" with Methyltestosterone

Healing of fractures is often delayed because impairment of osteoblastic activity due to declining sex hormone function causes the bone matrix to atrophy.

Older patients with fractures, particularly of the hip, respond well to combined estrogen-androgen therapy. The prognosis for bone recalcification is good provided treatment is continued for extended periods.*

*Reifenstein, E. C., Jr., in Harrison, T. R.: Principles of Internal Medicine, ed. 2, New York, The Blakiston Company, Inc., 1954, chap. 98, pp. 702, 703.

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MINNESOTA

Officers of the Board of Osteopathic Examiners are: President, Robert H. Clark, Northfield; vice president, E. C. Goblirsch, Little Falls; and secretary-treasurer, Wallace F. Kreighbaum, Minneapolis. Dr. Clark was recently reappointed to the board.

Basic science examinations April 1-2 at University of Minnesota, Minneapolis. Address Raymond N. Bieter, M.D., secretary-treasurer, Board of Examiners in the Basic Sciences, 105 Millard Hall, University of Minnesota, Minneapolis 14.

MONTANA

Clem L. Shafer, Helena, T. G. Gunderson, Billings, and Asa Willard, Missoula, have been reappointed to the Board of Osteopathic Examiners. Dr. Shafer is president of the Board, Dr. Gunderson is treasurer, and Dr. Willard is secretary.

Examinations March 4. Address Asa Willard, D.O., secretary, Board of Osteopathic Examiners, Wilma Bldg., Missoula.

NEVADA

Walter L. White, Reno, John H. Pasek, Minden, and W. J. Walker, Reno, have been reappointed to the Board of Osteopathic Examiners.

Basic science examinations April 8. Address Donald G. Cooney, Ph.D., secretary, Board of Examiners in the Basic Sciences, Box 9005, University Station, Reno.

NEW HAMPSHIRE

Examinations March 12-13 at Concord. Address John S. Wheeler, M.D., secretary, Board of Registration in Medicine, State House, Concord.

NEW MEXICO

Basic science examinations January 19. Address Mrs. Marguerite Cantrell, secretary, Board of Examiners in the Basic Sciences, P.O. Box 1522, Santa Fe.

NORTH CAROLINA

Guy T. Funk, Winston-Salem, has been elected president of the Board of Osteopathic Examination and Registration. Frank R. Heine, Greensboro, is secretary. S. Dales Foster, Asheville, was reappointed to the Board.

NORTH DAKOTA

John O. Thoreson, Bismarck, has been elected secretary-treasurer of the Board of Osteopathic Examiners.

OKLAHOMA

Fred H. Erhardt, Oklahoma City, was elected president of the Board of Osteopathy. Other officers are S. L. Stacy, Fairland, vice president, and G. R. Thomas, Oklahoma City, secretary-treasurer. Dr. Thomas was recently reappointed to the Board.

Dr. Erhardt also was named to the Board of Examiners in the Basic Sciences.

RHODE ISLAND

Examinations April 3-4 at Providence. Address Mr. Thomas B. Casey, Administrator of Professional Regulation, 366 State Office Bldg., Providence.

Basic science examinations in February at the State Office, Providence. Applications must be filed 21 days prior to examinations. Address Mr. Casey.

SOUTH DAKOTA

Oscar A. Jungman, D.O., Scotland, was reappointed to the Basic Science Board.

TENNESSEE

Examinations in February at Nashville. Address Marion Edmund Coy, D.O., secretary, Board of Examination and Registration for Osteopathic Physicians, 1226 Highland, Jackson.

L. Dale Chesemore, Paris, has been elected president of the Board. Marion Edmund Coy, Jackson, was re-elected secretary-treasurer.

Basic science examinations given every 3 months. Address O. W. Hyman, M.D., secretary, Board of Basic Science Examiners, 874 Union Ave., Memphis 3.

UTAH

Leland W. Shafer, Salt Lake City, is president of the Osteopathic Examining Board, and Wilford G. Hale, Logan, is secretary. Dr. Hale was recently reappointed to the Board.

WISCONSIN

Basic science examinations March 29 at the University of Wisconsin Chemistry Building, Room 100, Madison. Applications must be filed by March 21. Address Mr. W. H. Barber, secretary, Board of Examiners in the Basic Sciences, Ripon College, Ripon.

WYOMING

Examinations February 3. Address Franklin D. Yoder, M.D., secretary, Board of Medical Examiners, New State Office Bldg., Cheyenne.

Reregistration of osteopathic licenses

January—Alberta. No reregistration. Pay $10 a year membership in the College of Physicians and Surgeons, Alberta, in January.

During January—Connecticut, $2. Address Frank Poglitsch, D.O., secretary, Osteopathic Examining Board, 300 Main St., New Britain.

During January—Minnesota, $2. Address Wallace F. Kreighbaum, D.O., secretary, Board of Osteopathic Examiners, 2748 Hennepin Ave., Minneapolis 8.

During January—Wisconsin, not to exceed $5. Amount to be fixed by state board. Address Thomas W. Tormey, Jr., M.D., secretary, Board of Medical Examiners, State Office Bldg., 1 W. Wilson St., Madison.

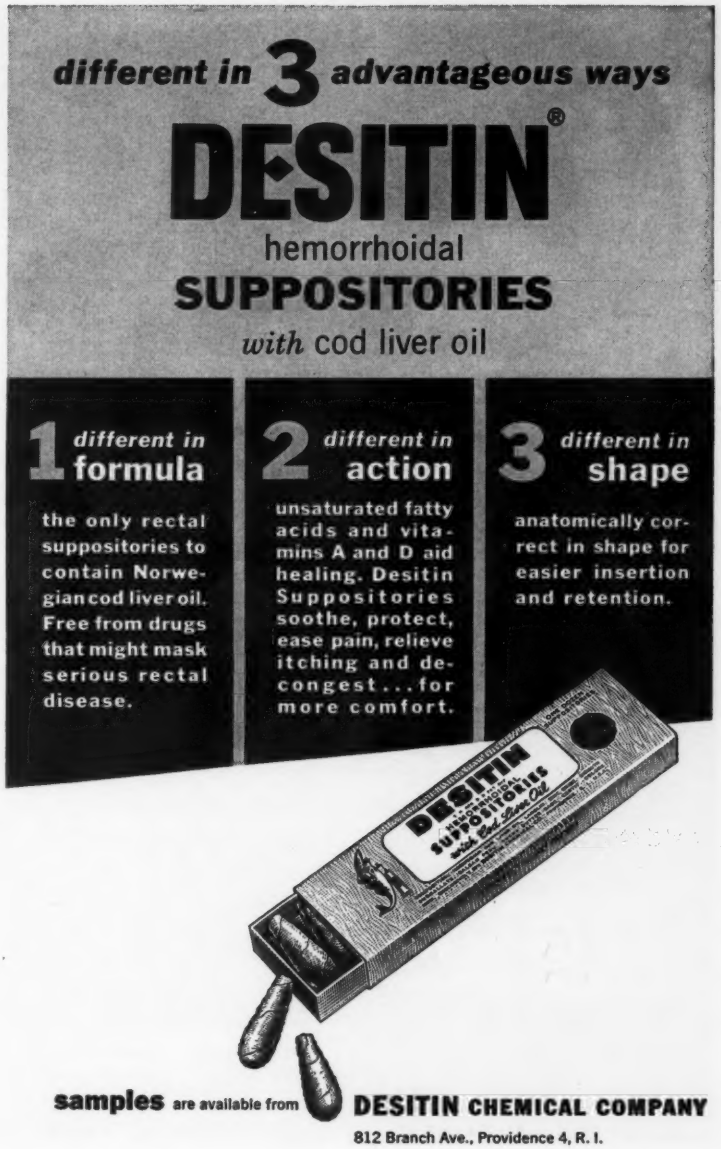
January 31—British Columbia, amount of fee set at Annual Meeting of Council of College of Physicians and Surgeons of British Columbia. Address Lynn Gunn, M.D., registrar, 1807 W. 10th Ave., Vancouver 9.

Prior to February 1—Vermont, $3 residents, $2 non-residents. Address Charles D. Beale, D.O., secretary, Board of Osteopathic Examination and Registration, Mead Bldg., Rutland.

Prior to March 1—Colorado, $2 if legal resident of state, $10 if not resident. Address Mrs. Buelah H. Hudgens, executive secretary, Board of Medical Examiners, 1612 Tremont Pl., Denver 2.

On or before April 1—Montana, $2 for those in active practice, $1 for those inactive. Address Asa Willard, D.O., secretary, Board of Osteopathic Examiners, Wilma Bldg., Missoula.

April 1—Wyoming, $2.50. Address Franklin D. Yoder, M.D., secretary, Board of Medical Examiners, New State Office Bldg., Cheyenne.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Examination by National Board

The National Board of Examiners for Osteopathic Physicians and Surgeons conducts Parts I and II of its examination on the first Thursday and Friday of each May and December at the six approved colleges. Application blanks may be obtained from the secretary or the dean of the college, and the completed application blank, together with a passport photograph and check for the parts to be taken must be in the secretary's office by the November 1 or April 1 preceding the examination.

Examinations in Part I consist of anatomy, including histology and embryology; physiology; physiological chemistry; general pathology; and bacteriology, including parasitology and immunology.

Part II consists of examinations in surgery, including applied anatomy, surgical pathology, and surgical specialties; neurology and psychiatry; public health, including hygiene, medical jurisprudence; osteopathic principles, therapeutics, including pharmacology and materia medica.

Part III is an oral and practical examination given under the supervision of

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a chief examiner who is a member of the Board and by a panel of associate examiners. Subjects covered in Part III are anatomy; physiology; pathology; osteopathic principles; therapeutics, and pharmacology; surgery, ophthalmology and otorhinolaryngology; obstetrics and gynecology; physical and clinical diagnosis; public health and communicable diseases.

These are oral examinations which the candidate may take after having satisfactorily completed the first 6 months of a 1 year internship in a hospital approved by the American Osteopathic Association for intern training. Part III is given annually at the Philadelphia, Kirksville, and Los Angeles colleges.

Eligibility requirements are as follows: Part I, satisfactory completion of the first 2 years in an approved school of osteopathy; Part II, satisfactory completion of Part 1 and of the first two quarters or trimesters of the senior year in an approved osteopathic college; Part III, satisfactory completion of Part II and at least 6 months of a 1-year internship approved by the American Osteopathic Association. The internship requirement does not apply to candidates who took Part I prior to July, 1950.

Applications must be filed with the secretary of the Board not less than 30 days prior to the examination dates. Address Paul van B. Allen, D.O., secretary, 1512 N. Delaware Street, Indianapolis 2.

Specialty board examinations

OBSTETRICS AND GYNECOLOGY

Examinations February 7-8, 1958, Cosmopolitan Hotel, Denver. Address Jacquelin Bryson, D.O., secretary-treasurer, American Osteopathic Board of Obstetrics and Gynecology, 3300 East 17th Ave., Denver 6.

Radiation . . . a public health problem*

Alexander Rihm, Jr., P.E.
Chief Radiological Health and Air Sanitation Unit
and James E. O'Brien
Associate Sanitary Chemist
Division of Laboratories and Research
New York State Department of Health

Radiation in the form of light and heat from the sun has been the companion of living things since the beginning of time. All living creatures, in fact all forms of life, are dependent upon it and man in his more reflective moments thanks his Creator for its benefits.

Within the past sixty years, we have become acquainted with other forms of radiation, both natural and artificially produced, such as cosmic rays, gamma rays, X-rays, beta particles, alpha particles and neutrons.

We have been well aware for countless ages that some forms of radiation can be injurious, if not used judiciously. For example, heat waves will burn and destroy tissue exposed to them in too great intensity or for too long a period. This phenomenon is part of man's everyday experience. On the other hand, the damaging effects of some of the more recently discovered forms of radiation are more insidious since the physical manifestations are not so obvious as those associated with heat waves. Failure to realize these dangerous aspects of the new forms of radiation with which they were working caused painful injuries to some of the early scientists and, in a few cases, cut short their lives.

It is now a well recognized fact that certain forms of radiation are extremely dangerous as well as useful. It is imperative that safeguards be set up to protect users and the public from the damaging effects of these rays and to control the distribution in our environment of substances which emit them.

*Reprinted by permission from *Health News*, New York State Department of Health, March 1957.

This article deals only with those high energy radiations capable of causing ionization. It will not include those radiations of lower energy, such as infrared, ultraviolet, radio waves, and visible light.

High energy radiations in the form of X-rays, gamma rays, beta particles, alpha particles, neutrons, and the like, cause damage by a process called ionization. When such radiations interact with matter, whether it be air, concrete, steel, or human tissue, both the radiations and the absorbing substance are changed; the radiations lose some or all of their energy and the matter which they strike divides into positively and negatively charged parts called ions. This division or ionization, when it occurs in human tissue, can destroy the delicate electrical balance in the cells and, depending on the kind and location of tissues exposed and the extent of the damage, can produce significan physiological effects.

Cell damage appears to be the chief effect of exposure to radiation although other damage to tissue and to body fluids may occur. Ordinarily a cell recovers from light damage but severe injury can cause it to die. If enough cells are destroyed, the body suffers detectable damage. While injury may not always be apparent, there is general agreement that any exposure to radiation is basically harmful to body tissues. The specific injury produced in any given circumstance depends on many variable factors, such as the density of ionization, the kind of tissue irradiated, and location of cells affected. Injuries that have been observed include the mutation of genes, inactivation of enzymes, inhibition of cell division, and fatal disturbance of tissue functions.

The genetic aspects of radiation damage are receiving greater and greater attention, particularly since the publication in June, 1956 of the reports of the National Academy of Sciences on the *Biological Effects of Atomic Radiation*.[1] Every cell in a person's body contains a collection of diverse hereditary units called genes which are passed down from his parents. The genes are strung together to form threads of genetic material called chromosomes which are visible under a microscope.

All genes which an individual inherits are, in general, kept unchanged as the cells divide. However, genes can be changed by certain agents, notably heat, some chemicals and radiation. When such an alteration occurs, it is said that a cell mutates. When any mutation occurs in an ordinary body cell, it is passed along in future divisions of the cell but the mutant gene is not passed along to progeny. Thus, the effect is limited to the person within whom the mutation occurred. This effect, however, cannot be taken lightly, for various kinds of cellular abnormalities are known to be perpetuated within an individual through the body cell divisions so that the results are genetic in the broad sense. There is some evidence to indicate that effects of this sort measurably reduce life expectancy. Quantitative relations are not yet quite clear but it has been established that certain malignancies, such as leukemia and certain other cellular abnormalities, may be induced by ionizing radiations.

A mutation in a sperm or egg cell, however, is much more serious since, in this case, the child will inherit the mutant gene. Once changed, this altered gene will persist from generation to generation in its new or mutant form. There is considerable evidence to indicate that in a majority of instances, mutant genes eventually produce harmful effects although such effects are not completely manifested in the first generation of offspring.

Radiation affecting the body can emanate from sources external to the body or from radioactive materials deposited within the body tissues. Gamma rays, X-rays, and neutrons, for example, have high penetrating power and can damage internal organs, even if their source is outside the body. Alpha and beta particles, on the other hand, cannot ordinarily penetrate the outer layers of the skin and, while they may cause damage superficially if the exposure is high, they present only a minor external hazard. However, radioactive materials which emit alpha particles, such as radium and polonium, and materials which emit beta particles, if inhaled, ingested, or deposited in a wound, can become extremely hazardous if enough of the radioactive material remains long in vital parts of

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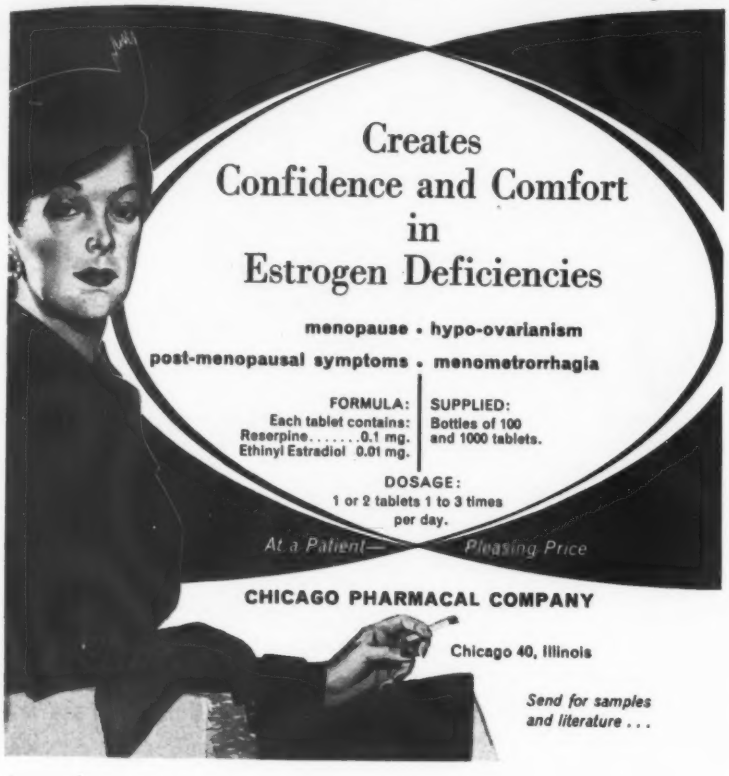

the body. Injuries from ionizing radiation then may be superficial, or deep, or both, depending on the type, the quality, the location of the source and the penetrating power of the radiation.

NATURAL RADIATION

Humans have always been exposed to small amounts of radiation in their normal environment. The earth is constantly being bombarded with cosmic radiation from outer space; the intensity of such radiation in the northern portion of the eastern United States has been estimated to be about two cosmic ray particles per square centimeter per minute.[2] The earth's crust, moreover, contains naturally occurring radioactive material primarily in the form of radium, uranium, and thorium. A one-foot thick layer of soil at the surface, one mile square, bears an estimated average of 2 grams of radium, 6 tons of uranium, and 12 tons of thorium. The earth's atmosphere has within it small concentrations of radioactive materials resulting primarily from the radioactive gases, radon and thoron. These gases are produced through decay of radium, uranium, and thorium normally present in the soil. Our drinking water which comes from rain that has fallen through the air or from water that has filtered through the ground, contains naturally radioactive substances. The amounts of radioactive materials to be found in water vary widely depending on local conditions. Although the concentrations of such materials in the majority of ground waters are extremely minute, many springs contain readily measurable amounts of radioactive substances which have been dissolved from natural geologic formations.

Even the food we eat contains radioactive material. Approximately 0.012 per cent of the element potassium occurs naturally in a radioactive form—K40. It is estimated that the body of a standard man[3] contains an average of 17 milligrams (0.23 microcuries) of this radioactive isotope.

The natural background radiation level to which all individuals are exposed varies with time of day, season, and location but is invariably very low when compared with the levels of radiation used in medicine, industry and research.

One cannot validly maintain, however, that natural background radiation is of no significance for its effects must be reckoned with in instrumentation and in exposure studies.

The employment of nuclear weapons, the expanding use of radioisotopes and the development of atomic power have stimulated public interest in ionizing radiation. For the first time in the history of man, the potential now exists for accidentally or purposely contaminating man's environment with large quantities of radioactive materials.

It is now possible to produce very large quantities of radioisotopes either in controlled nuclear reactors or through violent nuclear explosions. In either case the materials are of the same general character in that they are unstable and decompose spontaneously to produce other elements known as daughter products and, at the same time, emit one or more forms of ionizing radiation. The daughter products may also be radioactive (although not necessarily so) and may emit radiation.

That extensive environmental contamination with radioisotopes has not occurred to any significant degree indicates the care with which the atomic energy program has been developed and the adequacy of the health and safety procedures which have been established. It is essential to the welfare of humanity that these safeguards be maintained and strengthened.

FALLOUT

In any violent explosion, there is a considerable amount of debris in the form of dust ejected into the atmosphere. A nuclear or thermo-nuclear explosion is no exception. The important difference, however, in this type of explosion is that the dust carried into the atmosphere is largely radioactive resulting from (1) direct neutron bombardment of the dust at the time of the explosion, (2) the condensation of fission products on the dust nuclei carried into the atmosphere, and (3) unfissioned radioactive material from the bomb itself.

Neutrons are fundamental components of atoms and are released with tremendous velocity at the time of fission of atomic nuclei. When striking the nuclei of other stable atoms (in this case, atoms

of the materials making up the dust particles), they are absorbed, and radioactive isotopes are created. The nuclear explosion, therefore, is a giant generator of radioactive dust which is ejected into the atmosphere and disseminated over a great area.

The return of radioactive dust to the earth is generally referred to as fallout. The rate of its return is dependent on many factors such as the power of the bomb burst, the size and density of the dust particles, turbulence of the air, rainfall, and wind velocity.

The size of the radioactive particles rising from the site of a nuclear explosion is variable and, of course, the heavier particles settle relatively quickly. An appreciable proportion of the dust is extremely small and is subject to the buoyant effects of air turbulence. The speed and direction of upper air winds differ considerably at various levels and the effect of these variables on the movement and settling of radioactive dust is profound.

Libby[4] has indicated that dust particles from the relatively low powered atom bomb penetrate only the troposphere or lower stratum of the atmosphere and return to earth within a few months while those from the higher powered H-bombs penetrate the stratosphere where they may be held in suspension for as long as 10 years.

It is evident from data obtained in numerous tests at the Nevada Test Site that the area seriously affected by fallout from an atom bomb is not extensive; this is due chiefly to the fact that the bulk of the radioactive dust is relatively heavy and settles quickly and the bomb cloud is dissipated before it penetrates the rapidly moving upper air winds. Only delicate instruments are capable of detecting the radioactivity at points as much as 100 miles from the site. The area of heavy fallout from a hydrogen bomb, however, is very much greater. Data obtained in the spring of 1954 during the Bikini Atoll tests indicated that "about 7,000 square miles of territory downwind from the point of burst was so contaminated that survival might have depended upon prompt evacuation of the area or upon taking shelter and other protective measures."[5]

The number of radioactive isotopes that may be present in fallout is large and the periods of their activity vary depending on the identity of the isotope. While it might be expected that the isotopes with the longer half-lives would be the most dangerous, there are other significant factors to be considered in assessing danger associated with radioactive fallout. Biological life, or the length of time the ingested isotope remains in the body, and the affinity between the element and certain vulnerable tissues are the most important of these factors.

For example, Strontium 90 is a long-lived isotope with a half-life of approximately 28 years. Chemically it is similar to calcium and like calcium concentrates in the skeletal bones. Here it has a very long biological life and herein lies its potential hazard. Through the decay of Strontium 90, and especially of its high-energy daughter Yttrium 90, beta particles are emitted and cause the destruction of bone marrow whose function is to produce blood cells. If a great enough quantity of this element is taken into the body, the unfortunate victim then suffers from a deficiency of blood cells and is subject to all the ills associated with such a deficiency.

To cite another example, Iodine 131 is a short-lived isotope with a half-life of only eight days. In view of its short half-life, one might conclude that this isotope would not present a very important problem. Unfortunately, however, the radioactive iodine follows the same physiological processes as stable iodine and concentrates in the thyroid gland where its radioactivity can produce great damage in a comparatively short time. It is this attribute that makes Iodine 131 particularly dangerous.

When we speak of "fallout" we invariably associate the term with a nuclear explosion. While such explosions are, of course, the principal source of radioactive fallout, radioactive dusts and vapors may be dispersed also through the stacks of nuclear energy facilities as a result of the breakdown of safety measures. From a practical standpoint, however, this possibility is remote because of the elaborate safeguards that have been set up. Moreover, even if safety procedures should lapse and radioactive isotopes be released,

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the area contaminated undoubtedly would be quite limited.

In peace time, every effort must be made to prevent the promiscuous dispersal of radioactive material into the environment whether it be through air, water, or some other medium. Contamination of the air we breathe and the water we drink and the food we eat is particularly dangerous because, through these media, radioactivity can actually enter the body where it may become concentrated to a harmful extent.

Fallout may cause a detectable increase in radiation background and can have damaging effects on certain materials which are sensitive to radiation, such as those used in the photographic industry or in the manufacture of radiation detection instruments. In one instance in New York State, water containing fallout particles was used in the manufacture of packaging for photographic film and, since film is extremely sensitive to radiation, a considerable quantity became fogged by the contaminated paper. Data regarding specific radioisotopes and their maximum permissible concentrations in air and drinking water for provisional and for continuous use are available in various publications.[6, 7, 8]

In time of war, the assay of radioactivity in the environment would undoubtedly be a major problem in civil defense. Although in the early emergency phases, civil defense rescue teams and other defense workers would necessarily need to spend some time in the contaminated area to accomplish tasks assigned to them, it is possible that ordinary occupation of heavily contaminated areas would need to be suspended until the radiation decayed to a safe level.

In the later stages, extensive assays of residual radioactivity by laboratory measurement would be essential prior to normal occupation of the affected area. Air, water, food, and objects of all kinds might be contaminated. Even the soil and the crops grown in the area might be potential hazards. Every section and especially every food material and water supply would need examination. Although the task would be great, its accomplishment would be imperative.

Radioactivity which enters the environment as waste resulting from the use of radioactive materials or from the operation of nuclear reactors may offer an equal or greater potential hazard than fallout from nuclear test weapons. It is indeed fortunate that the potential danger to public health from these sources was recognized from the beginning of the atomic energy program and that comprehensive safety procedures were established.

Radioactive wastes are being discharged into the environment from many sources in the State as by-products of the medical diagnostic and therapeutic use of isotopes, research studies, industrial processes and the operation of nuclear reactors. So far as known, however, careful control has been maintained over these waste discharges. The radioactivity present in our environment has always been kept well below the level considered the maximum permissible for continuous exposure.

The use of isotopes is growing at a rapid rate. The number of isotope users and the number of shipments of isotopes from Oak Ridge are doubling approximately every four to five years. During the period August, 1946 through December, 1954, 64,202 shipments of isotopes the radioactivity of which was equivalent to more than 54,728 curies were sent to 4,063 institutions, industries and individuals throughout the United States and its possessions. Approximately 13 per cent of the radioisotope users are located in New York State. The greatest number of radioisotope shipments were for use in medical research, diagnosis, and therapy. Correspondingly, the greatest number of users were located in hospitals and clinics. On the other hand, more industrial concerns used isotopes than any other type of institution and the numbers of industrial users are growing rapidly. Approximately 99 per cent of the radioactivity in the materials shipped fell into slightly hazardous and moderately dangerous groups as defined by the National Committee on Radiation Protection in the National Bureau of Standards Handbook 42.[9] Less than 1 per cent of the radioactivity in the shipments fell into the very dangerous group; Strontium 90, which is generally shipped and used as a sealed source of radiation, comprised most of the material in this latter classification.

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1. *Lewis, J.M., et al.: J. Pediat.* 31:496.

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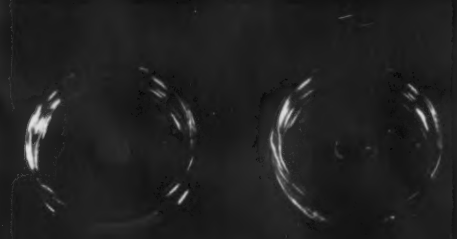

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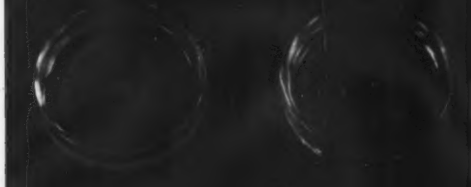

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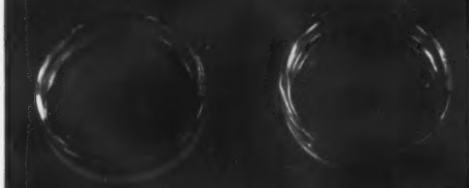

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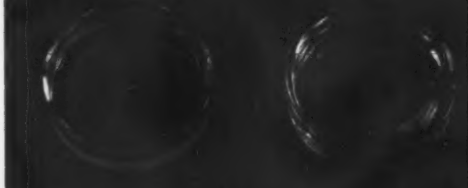

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Electrical energy generated from nuclear power sources is rapidly becoming a reality. In 1955, the first electrical energy derived from such a source for commercial use was generated at West Milton, New York. Power production here, however, is incidental to the operation of a submarine test reactor and the plant was not designed primarily for electrical power production purposes. The Consolidated Edison Company of New York has been granted a license by the Atomic Energy Commission to construct and operate a large nuclear power reactor in Westchester County. At present, there are two nonpower reactors operating in New York State and at least three more in various stages of planning, design, or development.

Growth of the use of electric power in the United States has been rapid since 1900. It has been predicted that facilities for production of an additional 1,000 billion kilowatt hours of energy annually will be built during the next 25 years. It has also been predicted that, in the next ten years, at least 10 per cent of all new electric power plants may be using atomic fuel. If such predictions are fulfilled, approximately 33 billion gallons of wastes containing radioactive fission products will be produced each year in processing the spent atomic fuel. Assuming an average fission product concentration of 10 millicuries per gallon—a value commensurate with known concentrations in existing installations—these wastes will contain roughly 330 million curies of radioactivity. Improvements in fuel processing and retention and storage of the more concentrated wastes may make possible a reduction in either the concentration or the volume of the wastes to be treated and discharged. It is probable, however, that one factor controlling the extent of the use of power reactors may be whether or not economical means for safe disposition of their wastes can be found.[10]

It is obvious from comparing the maximum permissible concentrations of fission products in drinking water with the estimated total yield of such products from the processing of reactor fuel that dilution alone cannot be considered as a long range method of disposal. The entire flow of the Mississippi River for example, would not be sufficient to dilute to a satisfactory level the fission products from the reactors that it is estimated will be built before 1964.

RADIOACTIVE WASTE DISPOSAL

The problem of radioactive waste disposal is complicated by numerous physical, chemical and biological factors which influence dispersal and behavior of radioactive elements in the environment. Extreme caution and exhaustive safety measures must be applied therefore in the release of radioactive substances.

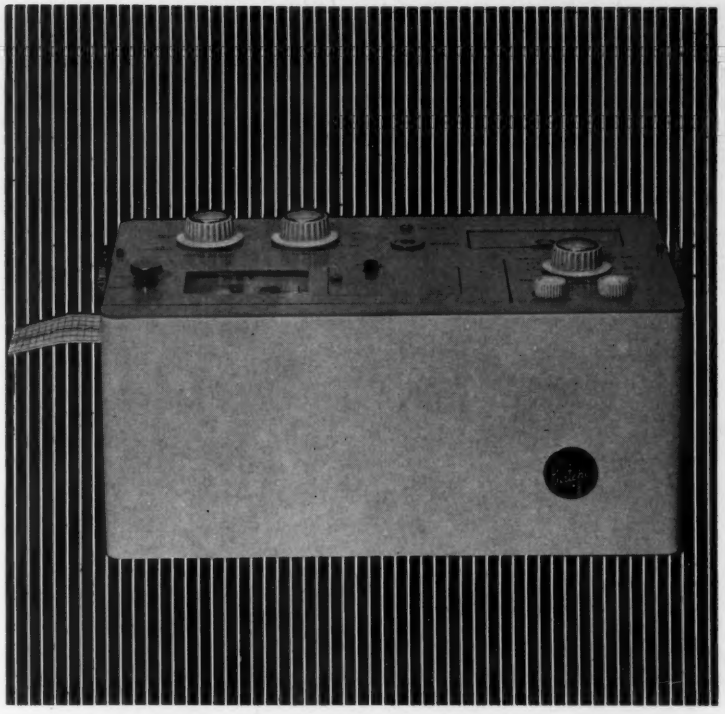
Many chemicals, including radioactive chemicals, are extracted from water through the metabolic activities of weeds, fish and microscopic organisms. This process frequently results in concentration of radioisotopes to a significant degree in the cell structure of the living organism. Under some circumstances, this process may constitute a serious hazard. Research on the many factors involved is in progress.

Clays and other soil constituents have absorptive and ion exchange properties which enable them to hold and concentrate radioactive elements. Suspended turbidity in streams, rivers and lakes, may absorb radioactive materials which, upon settling, may cause an increase in the radioactivity of bottom sediments.

In addition, consideration must also be given to the hydraulic and hydrologic factors, such as variation in stream flow, incomplete mixing due to stratification and streamline flow, bottom deposition, and velocity of flow. Meteorological conditions too affect the diffusion and dilution of airborne contaminants into the atmosphere; for example, rainfall washes out atmospheric contaminants. These factors are important in assessing the hazard associated with the dissemination of radioactive dusts into the air through stacks.

DIAGNOSTIC AND THERAPEUTIC USE OF RADIATION

The benefits of X rays and radioactive material for diagnostic and therapeutic purposes have been covered in a previous article in Health News.[11] Their application has become widespread without complete appreciation, on the part of many users, of the dangers to the population as a whole. The old adage "familiarity breeds contempt" appears to be applicable to the use of X rays and radium. Certainly, evidence has shown that X rays



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account for the major number of radiation over-exposures. In the isotope program under the official supervision of the Atomic Energy Commission, safety practices have been continually emphasized. Until recently, on the other hand, the use of X-rays and radium has expanded without sufficient controls, and many poor practices have developed.

While emphasis on health protection in the use of radioisotopes has led many people to be concerned about the dangers of exposure to radiation emanating from radioactive materials, the potential hazard has not been placed in proper perspective in relation to other sources of radiation. For instance, there was major public concern over a fallout which occurred in a section of New York State in 1953,[12] "the total radiation dose from which resulted in approximately 50 milliroentgens spread over a period of approximately ten weeks." Yet few persons would hesitate to have a few chest X rays or dental examinations the radiation from which might far exceed that resulting from the fallout in terms of total radiation dose to the body. Because of the large number of X ray installations in New York State, these sources of radiation at present are considered a greater potential hazard to the public than radioisotopes or fallout from atomic test weapons.

The detection and measurement of radiation must be accomplished by the use of special instruments. The operation of all such instruments is based on the ability of radiation to cause ionization; the devices vary only with respect to the medium in which the ionization takes place and the method by which the ionization is detected and indicated. Four classes of media are employed at present in the detection of radiation:

(1) *Gases (ionization), proportional and Geiger-Mueller type chambers.*

These instruments, based on the principle of collecting ions formed by the action of radiation in a gas, comprise the majority currently used. High voltage impressed across an enclosed volume collects the ions, which are positively and negatively charged resulting from the ionization of the gas molecules and the resultant charge, current flow, or pulse is measured on an external meter.

(2) *Photographic emulsions.*

Radiation results in ionization of the silver halide in the emulsion. This causes darkening of the film after development. Since the darkening is proportional to the amount of radiation received, it is possible, with properly standardized film, to estimate the amount of radiation to which it has been exposed by evaluating the darkening effect with an instrument called a densitometer.

(3) *Scintillation materials.*

A number of materials have the property of converting the ionizing energy of radioactivity into light energy. These materials are called scintillators and the effect is known as scintillation. A particularly valuable aspect of the process is that different materials respond or scintillate to different types of radiation; thus, alpha, beta and gamma radiation can be evaluated separately by employing scintillators which respond to each particular type.

The amount of light produced is very minute and measurement is possible only by means of a marvel of electronic art known as a multiplier phototube. This instrument converts light energy to electrical energy and amplifies the pulse sufficiently to permit measurement on an external meter or other device.

(4) *Chemical effects.*

Ionizing radiations can bring about decomposition or modifications of some chemical components; these changes can be measured by ordinary chemical reactions or by physical effects. Fundamentally, the processes are similar to those produced in photographic emulsions. For example, in the phosphate glass dosimeter approved for civil defense purposes by the Federal Civil Defense Administration, the phosphate glass optical density is changed by ionizing radiation which penetrates the plastic case and the glass. The change in density may be evaluated by a densitometer.

Similarly, in a chemical dosimeter still in the experimental stage, ionizing radiation brings about a change in pH in a liquid. This change is manifested by a color alteration in a pH indicator.

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Swimming pool injuries, mycobacteria, and tuberculosis-like disease*

Arnold E. Greenberg, S.M., and Edward Kupka, M.D.†

Abrasive accidents in swimming pools are not rare. They may occur in diving, in getting in or out of the pool, or in underwater swimming. Most frequently such accidents involve the bridge of the nose, the elbows, or the knees. Although in themselves they are seldom of consequence, it has recently been recognized that this type of accident may lead to inoculation lupus vulgaris, granulomatous tuberculosis lesions, or other tuberculosis-like lesions.

MYCOBACTERIUM TUBERCULOSIS

Hellerström,[1] in 1951, reviewed six cases of inoculation lupus vulgaris, some of which he had reported as early as 1939.[2] They were all associated with swimming-pool injuries. Describing the clinical features, which were strikingly uniform, he wrote:

> Within an area of a couple of square centimeters or more on the bridge of the nose an eruption developed, which consisted of soft papules, reddish-violet to reddish-brown in color, and ranging in size from a pinhead to a split pea; some of the papules were topped by crusts and coalesced. Two of the cases presented elevated ulcers measuring 15 by 15 and 7 by 7 millimeters, respectively. In the major proportion of cases the initial abrasion had healed when the papules appeared in the vicinity. On diascopic examination the papules showed the distinctive color of lupus nodules, and they were easily penetrated by a blunt probe applied with slight pressure. Hence, the clinical diagnosis was lupus vulgaris. The regional lymph nodes were either not at all, or only slightly to moderately, enlarged.

In one case, Hellerström observed acid-fast bacilli in the lesions, thus affording some laboratory confirmation to his diagnosis.

Later Hellerström,[3] using more sensitive laboratory techniques, was able to isolate the tubercle bacillus from one swimming pool. He felt that the problem of skin tuberculosis acquired in swimming pools was complex and far from being solved. He suggested that, although tuberculosis control officers and sanitary engineers have an interest, "tuberculosis as a waterborne infection is a problem that calls for the attention of dermatologists . . ."

*Reprinted from *Public Health Reports*, October 1957.

†Mr. Greenberg is chief of the sanitation laboratory, and Dr. Kupka is chief of the bureau of tuberculosis, California State Department of Public Health, Berkeley.

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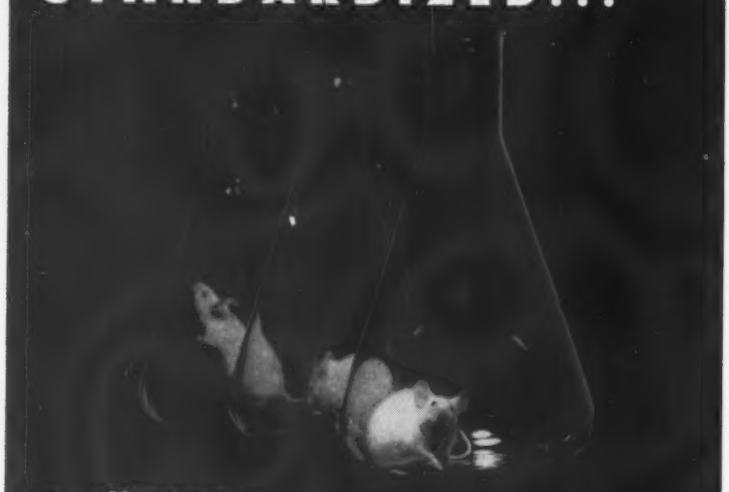

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Also in 1951, Cleveland[4] reported four cases from Canada. He concluded that "the clinical and histopathologic appearance of the lesions was strongly suggestive of tuberculosis cutis" although "no acid-fast bacilli were demonstrated in the lesions . . ." All Cleveland's cases were associated with the same swimming pool, which was filled with tidal sea water and was under good sanitary control. He believed that the pool contamination might have resulted from the discharge of urine or sputum from an infected person. In summary, Cleveland suggested that "tuberculous infection may occur more often than the absence of reported cases would indicate."

In commenting on these papers, Sulzberger and Baer[4a] suggested that the etiology was questionable. They pointed out that the smegma bacillus may be present in pools in large numbers and also that this organism when inoculated into the skin produced a "tuberculoid type of response."

MYCOBACTERIUM BALNEI

In a comprehensive monograph, Linell and Nordén[6] summarized previous studies and described an epidemic of 80 cases of benign skin ulceration in Orebro, Sweden. They isolated a previously unknown *Mycobacterium* very similar to Koch's bacillus and gave it the specific name *balnei*.

Linell and Nordén's cases were characterized by a papular lesion of spongy consistency which was typically located on the outside of the elbow. The lesion grew slowly and eventually crusted, with scaling of the surrounding skin. Thick secretion developed under the crust and healing proceeded slowly, leaving a bluish-red soft scar. The whole sequence could last 2 years, especially if complicated by purulent infection. Histologically most of the lesions were granulomatous, and acid-fast bacilli were demonstrated in only one case. However, the organism was isolated from both the water and the walls of the swimming pool associated with the epidemic, and laboratory studies on animals and human volunteers (the authors) proved conclusively that *M. balnei* was the etiological agent. No new cases occurred after the pool was rebuilt, replacing the rough concrete walls with smooth tiles, and the chlorination system made more effective.

Zettergren, cited by Linell and Nordén,[6] reported a similar episode of 60 cases in Västeras, Sweden. Although *Mycobacterium marinum* was considered the etiological agent by Zettergren, Linell and Nordén isolated *M. balnei* from lesions and from the pool. The term "mycobacteriosis balnearea" was applied to the syndrome. When breakpoint chlorination was introduced, the epidemic was brought completely under control.

OTHER REPORTED CASES

Brück,[7] in 1951, described 3 cases of inoculation tuberculosis, 2 of which were associated with swimming pool injuries. In 1952, he reported another case of inoculation lupus.[8] Isolation of the tubercle bacillus from the lesions completely confirmed the clinical diagnosis. These findings led Brück to conclude that "so-called swimmer's lupus," or mycobacteriosis balnearea, could be separated into two types: (*a*) cases in which *M. tuberculosis* was the causative agent, and (*b*) cases in which *M. balnei* was responsible for the infection. He placed his 1952 case and those of Hellerström in the first category, and the cases of Linell and Nordén and Zettergren in the second. Hellerström, in a paper already cited,[3] reviewed all of the available case histories and concluded with Brück that similar clinical manifestations may have been due to different etiological agents. He suggested, however, that the organism isolated by Linell and Nordén might be a mutant of *M. tuberculosis*, or that it might be *M. marinum* as believed by Zettergren. He was unwilling to accept *M. balnei* as the responsible agent.

Tolmach and Frank,[9] in the United States, reported another case of inoculation lupus vulgaris, which was characterized as skin granuloma with tubercle formation of unknown etiology. This infection resulted from a nose abrasion in a swimming-pool accident.

Nine cases of post-swimming-pool abrasion infections diagnosed as tuberculosis verrucosa cutis were observed by Rees and Bennett[10] in San Francisco. The clinical picture was quite different from that given by Hellerström. As to the etiology, Rees and Bennett ruled out granuloma due to silicates, and deep fungus infections, but they were unable positively to define the agent. They mentioned the possibility of infection by the smegma ba-

cillus or by *M. tuberculosis*, although neither was demonstrated in the lesions or the pool.

In the 1954-1955 Year Book of Dermatology and Syphilology,[5b] Sulzberger and Baerre reviewed the monograph by Linell and Norden and commented as follows: "This is a masterly clarification of a relatively new entity apparently caused by a quite newly discovered acid-fast mycobacterium [*M. balnei*]. It appears virtually certain that this is the entity previously described by Hellerström in Sweden, D. E. H. Cleveland in Canada, Rees and Bennett and Jesse Tolmach and S. B. Frank . . . in the United States. It is small wonder that this infection of the bridge of the nose and other sites was in the past often considered a type of tuberculosis, and it is likely that the uninitiated will continue in this error in many future cases."

CONCLUSION

It is clear from the foregoing review that a new disease entity—a lupuslike dermatitis—and possibly a new means of transmitting skin tuberculosis are now known. What is not known is how widespread or frequent the infections are. The finding of cases in Europe, Canada, and the United States would indicate widespread geographic distribution. Those concerned with the operation of swimming pools should be aware of the potential hazard from this source, and the clinician should consider swimming-pool trauma in the diagnosis of tuberculosis-like skin infections.

From the limited data available, it would appear that swimming-pool construction and sanitation may play a significant role in controlling the spread of this disease entity. Smooth-surface walls and breakpoint chlorination have proved effective in curtailing epidemics.

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Biological warfare and its defense*

LeRoy D. Fothergill, M.D.†

Since any enemy nation might be expected to use all the weapons in its arsenal, it would follow that it would give serious consideration to biological warfare. Because of this possibility it is incumbent upon each of us to become fully acquainted with the nature of biological warfare.

WHAT BW IS

By way of definition, biological warfare is the intentional use of living microorganisms or their toxic products for the purpose of destroying or reducing the military effectiveness of man. Man may also be injured secondarily by damage to his food crops or domestic animals. The military objective, of course, is to reduce the will or capability to wage war.

*Reprinted from *Public Health Reports*, October 1957.

†Dr. Fothergill, scientific adviser to the Chemical Corps, Fort Detrick, Md., delivered this paper at a joint meeting of the Nevada State Medical Association and the Reno Surgical Society, at Reno, August 1956.

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It has sometimes been said that BW is public health practice and procedure in reverse. This is an erroneous conception. BW is the deliberate use of natural disease agents whose inherent potential has been exploited by scientific research and development resulting in the production of BW weapons systems.

Military campaigns and troop concentrations have always provided a fertile field for naturally occurring epidemic disease. Infectious disease has often been the critical factor in the outcome of a military campaign.

Bubonic plague was said to have stopped the Crusaders at the very gates of Jerusalem. Dysentery probably caused more casualties in Napoleon's Grand Army than enemy firearms. Typhoid fever and dysentery played no favorites among the opposing forces in the Civil War, the Boer War, and the Spanish-American War. The new science of bacteriology was in its infancy around 1900. Even during World War I, infectious disease was a controlling factor in some campaigns. It is quite clear that typhus fever prevented the Germans from carrying through their Balkan campaign.

In spite of all our modern sanitation and preventive medicine, infectious disease contributed a large share to the cost and difficulty in World War II. Malaria ranked high as an enemy, both in the Mediterranean and in the Southwest Pacific, and scrub typhus caused some 7,000 casualties in the latter area. And finally, it seems almost yesterday that enteric infections, Japanese B encephalitis, and hemorrhagic fever were bedeviling us in the Korean conflict.

In the past, a number of crude, unscientific and purely local efforts were made to utilize infectious disease for military purposes. Alexander attempted such exploitation by catapulting the bodies of dead men and animals over the walls of besieged cities. It is reported that smallpox was started successfully among the American Indians during the French and Indian War by distributing blankets contaminated with purulent smallpox material. In World War I the Germans infected with glanders horses that were consigned from this country to the Roumanian cavalry. During World War II a number of units of the German Occupation Forces, particularly in Eastern Europe, were said to have been the target of local sabotage efforts with bacteriological agents.

All of these efforts were, of course, small, local, makeshift, and unorganized with respect to centralized control and direction. It was not until early in World War II that an officially planned program was devoted to research and development in biological warfare. This has continued to the present time as a recognized activity of the Department of Defense. Responsibility for carrying out a program was delegated to the Department of the Army which, in turn, assigned the operational responsibility to the Army Chemical Corps. The major portion of the research and development is conducted at Fort Detrick in Fredrick, Md. Close liaison is maintained with other Federal agencies having defensive responsibilities, including the Federal Civil Defense Administration, the Public Health Service, the Food and Drug Administration, and the Department of Agriculture. That a program of research and development continues in permanent facilities constructed for the purpose can be considered as recognition of the potential of the weapon and thus of the defensive problems which we must be prepared to meet.

EFFECTIVE AGENTS

Biological warfare is considered to be primarily a strategic weapon which makes it a particular defensive problem for civilian population centers. The major reason for this is that it has no quick-kill effect. The incubation period of infectious disease plus a variable period of illness even before a lethal effect make this weapon unsuitable for hand-to-hand encounter. A man can be an effective fighting machine throughout the incubation period of most infectious diseases. Hence, an enemy would probably consider this weapon as primarily suited for attack on static population centers such as large cities, and thus our principal concern is with civil defense. There is little point at the moment in considering how it may be used against troops.

An important operational procedure in BW for an enemy would be to create an aerosol or cloud of agent over the target area. This fundamental concept has stimulated much basic research concerning the behavior of biologic particulates, the pathogenesis of respiratory infections, the medical management of such diseases, and defense against their occurrence.

The question of epidemic disease also merits some discussion. Actually, only a limited effort has been devoted to this problem in the research and development program. Some of the bitterest critics of BW have assumed that the only potential would be in the establishment of epidemics. They then point out that with mankind's present lack of knowledge of the factors concerned in the rise and fall of epidemics, it is unlikely that a planned episode could be initiated. They argue further, and somewhat contradictorily, that our knowledge and resources in preventive medicine would make it possible to control such an outbreak of disease. We agree with this in general, and this is why this approach to BW defense has not been given major attention in the program. One can charitably hope that such critics never have to breathe air laden with an infectious agent!

Our main concern is what an enemy may accomplish in the initial attack on a target. This, of course, does not eliminate from consideration for this purpose agents that are associated naturally with epidemic disease. A hypothetical example will illustrate this point. Let us assume that it would be possible for an enemy to create an aerosol of the causative agent of epidemic typhus (*Rickettsia prowazekii*) over City A and that a large number of cases of typhus fever resulted therefrom. No epidemic was initiated nor was one expected because the population in City A was not lousy. Lousiness is a prerequisite for epidemic typhus. In this case, then, the military objective was accomplished with an epidemic agent solely through the results accomplished by the initial attack. This was done with full knowledge that there would be no epidemic. On the other hand, a similar attack might have been made on City B whose population was known to be lousy. One might expect some spread of the disease in this case, resulting in increased effectiveness of the attack.

The great inherent potency of BW agents is due to their capacity to multiply when successfully implanted in a susceptible host.

Biological agents are, of course, suitable for delivery through enemy sabotage, which imposes many problems in defense. One can let one's imagination run wild in this regard. One might mention a few obvious, but nevertheless important, areas. The air-conditioning and ventilating systems of large buildings are obvious targets. America is rapidly becoming a nation that uses processed, precooked, and yes, even predigested foods. This is an enormous industry that is subject to sabotage. One must include the preparation of soft drinks and the processing of milk and milk products. Huge industries are involved also in the production of biologic products, drugs, and cosmetics which are liable to this type of attack. These few major areas have been mentioned since sabotage in them would be far reaching in its consequences. Furthermore, all are subject to prophylactic defensive action.

Our major defensive problems, of course, are concerned with the possibility of overt military delivery of biological agents from appropriate disseminating devices. It should be no more difficult to deliver such devices than other weapons. The same delivery vehicles—whether they be airplanes, submarines, or guided missiles—should be usable. If it is possible for an enemy to put an atomic bomb on a city, it should be equally possible to put a biological agent cloud over that city. This points up an enormously important civil defense problem which will be considered in more detail later.

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ANTIFOOD BW

Another aspect of biological warfare is the possible use of biological agents for the reduction or destruction of agricultural crops and domestic animals, in other words, antifood biological warfare.

The importance of food, particularly during war, needs no emphasis. Actually food production is of major concern to most countries even during peacetime. We are one of the few countries in the unusual position of finding overproduction a major problem.

In all wars, moreover, military efforts

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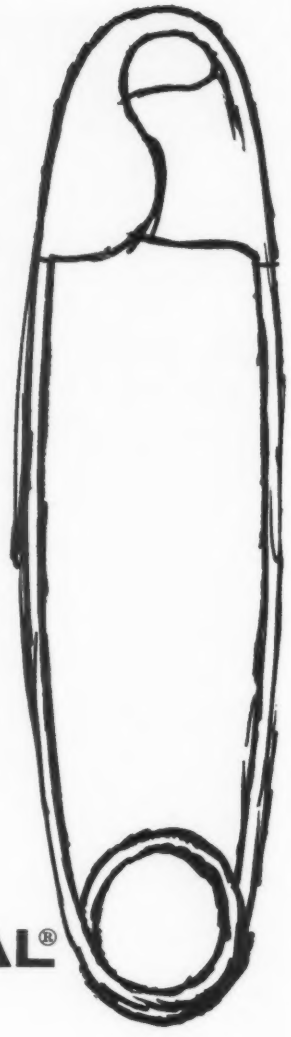

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have been devoted to the destruction of the enemy's food supply. The grain-laden freighter was as much a prize for a submarine as a ship loaded with tanks.

Biological warfare may find its greatest effectiveness when used for anticrop and antianimal purposes. Contrary to the case in antipersonnel BW, the epiphytotic and epizootic potential of anticrop or antianimal agents would be exploited by an enemy. Antifood biological warfare could play a decisive role in any war that was not decided with pushbutton speed. This country is in a favorable defensive position in anticrop warfare. Our cropping is very diversified and biological agents are, of course, specific for particular crops. Those countries that are generally dependent, for agronomic, climatic, or traditional reasons, on a single crop are the most vulnerable.

It is hoped that this general consideration of biological warfare will serve as a useful framework around which one can build one's defensive thinking and planning. Let us now consider some of the general features of this problem.

DEFENSIVE BANK ACCOUNT

It may seem trite, but nevertheless it is worth while to emphasize, that there is a vast amount of medical knowledge in existence which can be useful. In this sense BW is not completely new. We have had long medical and epidemiological experience with infectious diseases. We have a vast public health effort in being at the Federal, State, and local levels. Our sanitary engineering practices and methods for disease control are at a high level of efficiency. All of these are positive values in our defensive bank account which can be drawn upon in an emergency and would be of great value.

The importance of particle size in such aerosols has been recognized. The natural anatomical and physiological defensive features of the upper respiratory tract, such as the turbinates of the nose and the cilia of the trachea and larger bronchi, are capable of impinging out the larger particles to which we are ordinarily exposed in our daily existence. Very small particles, however, in a size range of 1 to 4 microns are capable of passing these impinging barriers and entering the alveolar bed of the lungs. This area is highly susceptible to infection. The entrance and retention of infectious particles in the alveoli amounts almost to an intratissue inoculation.

In considering BW defense, it is well to know that there are a number of critical micrometeorologic parameters which must be met for an aerosol to exhibit optimum effect. Generally, bright sunlight is rapidly destructive to living micro-organisms suspended in air. There are optimal humidity requirements for various airborne agents. Neutral or inversion meteorologic conditions are necessary in order for a cloud to travel along the surface. It will rise during lapsed conditions. There are, of course, certain times during the 24-hour daily cycle when most of these conditions will be met. This is important in gas warfare also. Moreover, the importance of these meteorologic conditions has long been recognized in connection with certain natural phenomena such as the occurrence and persistence of smog over an area.

Certain other properties of small particles, in addition to those already mentioned in connection with penetration of the respiratory tract, are noteworthy in defense considerations. The smaller the particle, the farther it will travel downwind before settling. An aerosol of such small particles diffuses through structures in much the same manner as a gas, a property of considerable importance in connection with certain defensive considerations.

A number of unique medical problems might be created when man is exposed to an infectious agent through the respiratory route rather than through the natural portal of entry. Some agents have been shown to be much more toxic or infectious to experimental animals exposed to aerosols of optimum particle size than by the natural portal. Botulinal toxin, for example, is several thousandfold more toxic by the respiratory route than when given by mouth. In some instances, a different clinical disease picture may result from this route of exposure, making diagnosis difficult. In tularemia produced by aerosol exposure, one would not expect to find the classical ulcer of "rabbit fever" on a finger.

There are a number of agents that an enemy might select from the several classes of microorganisms (bacteria, viruses, rickettsiae, fungi, or toxic products

of certain organisms). There are, however, certain general characteristics that should be met in making a selection.

An enemy would obviously choose an agent that is believed to be highly infectious. Agents that are known to cause frequent infections among laboratory workers, such as those causing Q fever, tularemia, brucellosis, glanders, coccidioidomycosis, belong in this category.

An agent would likely be selected which would possess sufficient viability and virulence stability to meet realistic minimal logistic requirements. It is, obviously, a proper goal of research to improve on this property. In this connection an agent should be capable of being disseminated without excessive destruction. Moreover, it should not be so fastidious in its growth requirements as to make production on a militarily significant scale improbable.

An aggressor would seek minimal, naturally acquired or artificially induced, immunity in a target population. A solid immunity is the one effective circumstance whereby attack by a specific agent can be neutralized. It must be remembered, however, that there are many agents for which there is no solid immunity and a partial, or low-grade, immunity may be broken by an appropriate dose of agent.

There is a broad spectrum of agents from which selection for a specified military purpose might be made. An enemy might choose an acutely debilitating agent, a chronic disease producer, or one causing a high death rate.

It is possible that certain mutational forms may be produced such as drug-resistant strains. Mutants may be developed with changes in biochemical properties that are of importance in identification. All these considerations are of critical importance in considering defense and medical management.

One point needs serious emphasis. The likelihood of creating an entirely new agent of unique virulence, or new disease-producing capability, is extremely remote. Even the remarkable genetic progress made in producing bacterial transformation in recent years does not warrant deviation from this opinion at the present time.

Certain general considerations in connection with BW agents merit some discussion.

Biological agents are, of course, highly host-specific. They do not destroy physical structures as is true of high explosives. This may be of overriding importances in considering military objectives.

One must be unremitting in emphasizing that there is no secrecy concerning the agents which might be included in an overall BW arsenal. Only certain agents will meet the general and specific BW requirements. Both we and any potential enemy know them. This is not like inventing or rather synthesizing a new chemical poison. One frequently hears it said, "If we only knew what agents our potential enemies were working on, we would know what to defend ourselves against." This platitudinous statement is parroted ad nauseam. This is the kind of statement that is made by an ostrich before burying his head in the sand. A more appropriate conjecture would be to ask ourselves, "What are we doing about it? Are we doing enough?"

One must not be complacent, however, and be lulled into thinking that BW would be rendered ineffective by these aids. This is not so. These techniques have been developed over the years for dealing with naturally occurring infectious disease. The military exploitation of massive amounts of highly infectious agents through unusual portals of entry creates new problems for which these procedures were not designed and against which no experience has been developed. One might illustrate this point. Adequate means have been developed, for example, for delivering potable water to all inhabitants in a community. We now take this for granted. On the other hand, there is no known public health procedure that will deliver sterile air to all inhabitants of a city. Defense against a massive biological aerosol is a new and critically serious problem.

It is obvious, of course, that medical defensive planning for a community should not be limited to preparation for BW. BW will not cause extensive burns, broken bones, or radiation sickness. All defensive planning should be thoroughly integrated and should be designed to give

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the maximum practical relief for whatever disaster might befall. For the moment, however, we will consider BW defense only.

One of the most critical problems is detection or early warning. Biological clouds have no characteristics detectable by the senses. They are invisible, odorless, and tasteless, in contrast to certain gas clouds. Even if they possessed an odor, the odor-detecting sniff might result in a sufficient dose to produce an infection.

As is always true, an initial surprise attack will, of course, be the most serious. Later attacks may be suspected by their general characteristics such as possible noise of a disseminating device, recognition of a dud device, and, finally, the realization that something has been delivered that is not a conventional weapon.

The importance of such immediate detection and warning is that it may permit certain defensive actions of a physical nature. The gas mask, for example, affords excellent protection to the respiratory tract if it can be put on in time. Early warning may also permit timely entrance into collective shelters should they exist. It is possible to design quite efficient structures for this purpose.

Some progress is being made in the development of instrumentation for rapidly detecting unusual concentrations of particulate matter in the air.

A closely related problem is rapid specific identification of the particular agent. The ordinary biological methods, employed in the diagnostic laboratory, are far too slow. Identification of viruses is especially tedious. This problem is important in that if the agent can be identified in time, it may permit certain medical prophylactic procedures before the onset of illness. Progress is being made in this field, but much remains to be done. One might suggest at this time that any laboratory conducting research to improve and speed up identification of disease organisms will be making a significant contribution to the defense effort.

DEFENSE NEEDS

Another defensive activity is decontamination or cleanup after an attack. Much technical knowledge has been developed in this field and is available to defense authorities. One might point out that most of the effort has been devoted to developing procedures for specific and isolated use. One could not hope to decontaminate an entire city. Indeed, this would not be necessary. Sunlight and time are remarkable decontaminants. One may have urgent need, however, for decontaminating specific equipment, structures, or isolated areas.

The most important of all defensive procedures is prophylaxis by active biological immunization. A number of effective immunizing materials are already available for some infectious diseases. On the other hand, there are a number of potential BW agents against which there is no method of immunization. There are several cases where the value of the immunizing material continues to be questionable, at least or where improvement must be sought through research.

One must encourage all research possible that is devoted to the development of new or improvement of old methods of active immunization. All ancillary research dealing with host-parasite relationships will have positive defense value. Moreover, all such research has great peacetime value. It will not be totally consumed in an engine of war.

The administrative problems in connection with the immunization of large populations against a number of agents are enormous. This, too, is an area where research should be fruitful because simplified techniques for rapid, mass immunization are essential. Considerable effort is being devoted to the development of combined or multiple vaccines, an effort that is being rewarded with some success.

There is also the very large field of passive biologic and antibiotic prophylaxis, that is, the use of antimicrobic agents after exposure to the agent but before the onset of illness. This problem merits some detailed discussion.

The use of immune serums, even if effective, would be extremely limited in BW. The production and distribution of

the enormous quantities required would be very difficult if not totally unrealistic. On the other hand, the desirability of having some stocks in hand for limited and specialized use should be kept in mind.

More detailed discussion is warranted in connection with the possible prophylactic use of antibiotics and chemotherapeutic drugs. The importance of this has been overplayed in the past. It is essential, therefore, to point out many of the shortcomings of this form of prophylaxis as a guide to future effort.

On several occasions articles have appeared expounding the thesis that our enormous antibiotic industry has made biological warfare obsolete. This is, of course, ridiculous for a variety of reasons. To permit such reasoning to guide our preparation for defense would be suicidal.

There are many potential BW agents for which there is no known effective antibiotic or drug. Among these may be mentioned *Coccidioides immitis, Histoplasma capsulatum,* and, more importantly from a BW standpoint, most of the filtrable viruses.

While we have some antibiotics that exhibit a considerable spectrum of activity, there are others whose greatest value is in use against a specific agent. For prophylactic BW defense after an attack, it would mean, therefore, having the right antibiotic in the right amount at the right place at the right time—a logistic requirement that is almost impossible to meet. Even these considerations may be academic, moreover, when it is realized that the use of drug-resistant strains of agents is not an unlikely possibility.

In some cases it has been shown that giving an antibiotic immediately after exposure merely prolongs the incubation period without preventing infection. Our British colleagues have recently reported that monkeys exposed to lethal respiratory doses of anthrax spores could be treated for several weeks with an antibiotic and would show no signs of infection during that time. When the drug was withdrawn the animals promptly developed fatal anthrax.

One might conclude this discussion of strictly medical prophylaxis by emphasizing that the greatest hope for defense against BW would be the development of effective methods for producing active immunity. Passive prophylaxis with antibiotics and drugs may have limited value. This procedure must not, however, be regarded as a panacea that will render BW obsolete.

There is some additional activities that should be mentioned in connection with BW defense.

Maintaining an adequate epidemiological intelligence service and warning network is of great importance. An unusual occurrence of disease in a particular location may be the first warning of a BW attack. The prompt recognition and reporting of such episodes is essential.

It is important to have available the services of an organized network of laboratories having the qualifications and equipment necessary for the recognition and identification of unusual agents. Such services are needed particularly in the virus field. The personnel in such laboratories should be trained and indoctrinated in those features of BW that may have a special bearing on their responsibilities. This should include training in the use of new detection devices and new procedures for more rapid identification of agents.

There must, of course, be adequate planning for optimum emergency hospital and medical service. Each community must plan the details in this connection.

Our defensive considerations may be concluded with a few words concerning prevention of sabotage. A careful vulnerability study should be made of all sensitive industries and facilities to determine the most likely spots of attack. This should include training in the use guarding of such spots. Loyal employees should be indoctrinated to the point of being able to augment such guarding. Adequate chlorination of water supplies should be assured. Air-conditioning and ventilating systems of sensitive buildings should be appropriately protected. And, finally, one must not neglect the simple but very effective techniques of heating or boiling food products.

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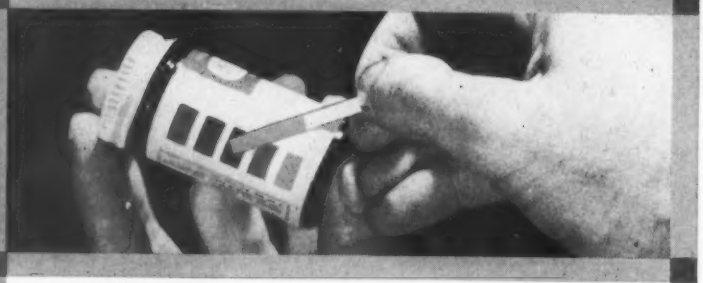
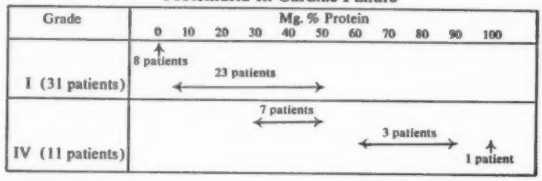


is there any correlation between the amount of protein in urine and the grade of heart failure?

Yes. There is a fairly positive correlation.

Source—Race, G. A.; Scheifley, C. H., and Edwards, J. E.: Circulation *13*:329, 1956.

Proteinuria In Cardiac Failure



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Books received

Books received for review during the period from November 5 to December 5, are listed below. Reviews will be published as space permits.

A TEXT-BOOK OF X-RAY DIAGNOSIS By British Authors. In Four Volumes. Volume 1. Edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., Director, X-Ray Diagnostic Department, University College Hospital, London; and Peter Kerley, C.V.O., C.B.E., M.D., F.R.C.P., F.F.R., D.M.R.E., Director, X-Ray Department, Westminster Hospital; Radiologist, Royal Chest Hospital, London. Ed. 3. Cloth. Pp. 521, with illustrations. Price $18.00. W. B. Saunders Company, West Washington Square, Philadelphia 5, 1957.

BONE DISEASES in Medical Practice. By I. Snapper, M.D., Director of Medicine and Medical Education, Beth-El Hospital, Brooklyn, N.Y. Cloth. Pp. 229, with illustrations. Price $15.00. Grune & Stratton, 381 Fourth Ave., New York 16, 1957.

A SYNOPSIS OF OTORHINOLARYNGOLOGY. By John F. Simpson, F.R.C.S., Consultant Surgeon, Ear, Nose, and Throat Department, St. Mary's Hospital, London, and Paddington General Hospital; etc.; Ian G. Robin, F.R.C.S., Consultant Surgeon, Ear, Nose, and Throat Department, St. Mary's Hospital, London, and Royal Northern Hospital, London; etc.; and J. Chalmers Ballantyne, F.R.C.S., Honorary First Assistant to Ear, Nose, and Throat Department, St. Mary's Hospital, London; Consultant Surgeon, Ear, Nose, and Throat Department, Royal Northern Hospital, London; Assistant Director, Audiology Unit, Royal National Throat, Nose, and Ear Hospital, London; etc. Cloth. Pp. 443, with illustrations. Price $8.50. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1957.

ALLERGY IN PEDIATRIC PRACTICE. By William B. Sherman, M.D., Associate Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons; Associate Attending Physician, Presbyterian Hospital; Attending Physician, Roosevelt Hospital, New York, N.Y.; and Walter R. Kessler, M.D., Ph.D., Instructor in Pediatrics, Columbia University College of Physicians and Surgeons; Assistant Pediatrician, Babies Hospital; Assistant Attending Physician, Roosevelt Hospital, New York, N.Y. Cloth. Pp. 296, with illustrations. Price $9.25. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1957.

THE PHYSIOLOGIC BASIS OF GASTRO-INTESTINAL THERAPY. Selected Topics. By Heinrich Necheles, M.D., Ph.D., F.A.C.P., Director, Department of Gastro-Intestinal Research, Medical Research Institute of Michael Reese Hospital; Attending Physician, Michael Reese Hospital; Professorial Lecturer in Physiology, University of Chicago, Chicago, Illinois; and Martin M. Kirshen, M.D., F.A.C.P., Professor of Clinical Medicine, Chicago Medical School; Attending Physician, Mount Sinai Hospital; Senior Attending Physician, Michael Reese Hospital, Chicago, Illinois. Cloth. Pp. 330. Price $8.75. Grune & Stratton, 381 Fourth Ave., New York 16, 1957.

CARDIOVASCULAR REHABILITATION. Edited by Paul Dudley White, M.D., Massachusetts General Hospital, Boston; Howard A. Rusk, M.D., Director, Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, New York; Bryan Williams, M.D., Clinical Instructor in Medicine, Southwestern Medical School, University of Texas, Dallas; and Philip R. Lee, M.D., Department of Internal Medicine, Palo Alto Clinic, Palo Alto, California. Cloth. Pp. 155. Price $6.50. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, 1957.

THE HEALING OF WOUNDS. A Symposium on Recent Trends and Studies. Edited by Martin B. Williamson, Ph.D., Professor of Biochemistry, Stritch School of Medicine, Loyola University, Chicago. Cloth. Pp. 202, with illustrations. Price $7.00. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, 1957.

PRACTICAL ALLERGY. By M. Coleman Harris, M.D., F.A.C.P., Formerly, Associate Clinical Professor of Internal Medicine (Allergy), College of Medical Evangelists, School of Medicine, Los Angeles, California; Attending Physician and Chief of the Department of Allergy, San Francisco Polyclinic and Postgraduate College; Attending Physician in Medicine (Allergy), Children's Hospital, San Francisco, California; and Norman Shure, M.D., M.S., F.A.C.P., Associate Clinical Professor of Internal Medicine (Allergy), College of Medical Evangelists, School of Medicine; Attending Specialist in Allergy, Veteran's Administration Hospital Center, Los Angeles, California. Cloth. Pp. 471, with illustrations. Price $7.50. F. A. Davis Company, 1914-16 Cherry St., Philadelphia 3, 1957.

THE HANDICAPPED AND THEIR REHABILITATION. Edited by Harry A. Pattison, M.D., F.A.C.P., Director of The Potts Memorial Institute, Inc. Cloth. Pp. 944, with illustrations. Price $14.75. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1957.

CIBA FOUNDATION COLLOQUIA ON ENDOCRINOLOGY. Volume II. Hormones in Blood. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Elaine C. P. Millar, A.H.-W.C., A.R.I.C. Cloth. Pp. 416, with illustrations. Price $9.00. Little, Brown & Company, 34 Beacon Street, Boston 6, 1957.

SURGERY OF HEAD AND NECK TUMORS. By Hayes Martin, M.D., Attending Surgeon, Memorial Hospital; Associate Professor of Clinical Surgery, Cornell University Medical College, New York. Cloth. Pp. 430, with illustrations. Price $18.50. Paul B. Hoeber, (Medical Book Department of Harper & Brothers) 49 E. 33rd St., New York 16, 1957.

ROENTGEN DIAGNOSIS OF ABDOMINAL TUMORS IN CHILDHOOD. By Charles M. Nice, Jr., M.D., Ph.D.; Alexander R. Margulis, M.D.; and Leo G. Rigler, M.D.; all from the Department of Radiology, University of Minnesota Medical School, Minneapolis, Minnesota. Cloth. Pp. 75, with illustrations. Price $4.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1957.

MANUAL OF PHARMACEUTICAL LAW. By William Pettit, Lecturer in Pharmaceutical Jurisprudence, University of Pittsburgh. Ed. 2. Cloth. Pp. 303, with illustrations. Price $4.50. The Macmillan Company, 60 Fifth Ave., New York 11, 1957.

TUBERCULOSIS: Every Physician's Problem. By J. Arthur Myers, M.D., Professor of Internal Medicine and Public Health, Medical and Graduate Schools, University of Minnesota, Minneapolis, Minnesota. Cloth. Pp. 290, with illustrations. Price $7.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1957.

PRACTICAL USE OF THE OFFICE LABORATORY AND X-RAY Including the Electrocardiograph. By Paul Williamson, M.D. Cloth. Pp. 323, with illustrations. Price $10.75. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1957.

CLINICAL ELECTROCARDIOGRAPHY. The Spatial Vector Approach. By Robert P. Grant, M.D., National Heart Institute, National Institutes of Health, Bethesda, Maryland. Cloth. Pp. 225, with illustrations. Price $7.50. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, 1957.

TEXT-BOOK OF ORTHOPAEDIC MEDICINE. Volume I. Diagnosis of Soft Tissue Lesions. By James Cyriax, M.D. (Cantab.), M.R.C.P. (Lond.), Physician to the Department of Physical Medicine, St. Thomas's Hospital, London. Ed. 3. Cloth. Pp. 711, with illustrations. Price $10.50. Paul B. Hoeber, (Medical Book Department of Harper & Brothers), 49 E. 33rd St., New York 16, 1956.

FADS AND FALLACIES IN THE NAME OF SCIENCE. By Martin Gardner. Paper. Pp. 363. Price $1.50. Dover Publications, 920 Broadway, New York 10, 1957.

THE DIAGNOSIS AND TREATMENT OF INFECTIONS. By D. Geraint James, M.A., M.D. (Cantab.), M.R.C.P. (Lond.); Clinical Assistant, The Middlesex Hospital, London. Cloth. Pp. 234. Price $6.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1957.

SYMPOSIUM ON DISEASES AND SURGERY OF THE LENS. Edited by George M. Haik, M.D., F.A.C.S., Diplomate, American Board of Ophthalmology; Professor of Ophthalmology and Head of the Department, Louisiana State University School of Medicine; Ophthalmic Surgeon, American College of Surgeons; Member, American Ophthalmological Society; Member, American Academy of Ophthalmology and Otolaryngology; Associate Editor, Elizabeth M. McFetridge, M.A. Cloth. Pp. 260, with illustrations. Price $10.50. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1957.

ANATOMIES OF PAIN. By K. D. Keele, M.D., F.R.C.P., Consultant Physician, Ashford Hospital and Staines Hospital. Cloth. Pp. 206, with illustrations. Price $5.50. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1957.

A TEXTBOOK OF PHARMACOGNOSY. By George Edward Trease, B.Pharm., D. de l'U., F.P.S., F.R.I.C., F.L.S., Professor of Pharmacognosy, Director of Pharmaceutical Studies and Head of the Department of Pharmacy in the University of Nottingham; Joint author of "The Chemistry of Crude Drugs." Ed. 7. Cloth. Pp. 808, with illustrations. Price $8.50. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1957.

MICROTECHNIQUES OF CLINICAL CHEMISTRY FOR THE ROUTINE LABORATORY. By Samuel Natelson, Sc.M., Ph.D., Chairman, Department of Biochemistry, Rockford Memorial Hospital, Rockford, Illinois. Cloth. Pp. 484, with illustrations. Price $11.00. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1957.

PORTRAIT OF AN AMERICAN LABOR LEADER: William L. Hutcheson. By Maxwell C. Raddock. Cloth. Pp. 430, with illustrations. Price $5.00. American Institute of Social Science, Inc., 763 Saw Mill River Road, Yonkers, N.Y., 1957.

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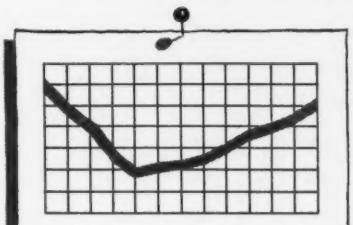

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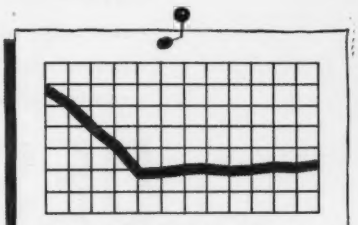


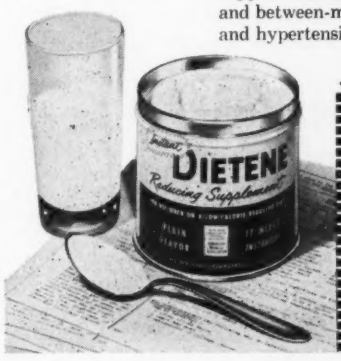
Obesity demands nutritional care. That is why you are urged to try the DIETENE DIET that promotes weight loss through sound nutrition . . . assures patient cooperation . . encourages the sensible eating habits necessary to maintain ideal weight.

Try the DIETENE DIET

(USE COUPON BELOW)

Whatever program you now follow, the DIETENE DIET assures you a safe, more natural way to give NEW help to obese patients. It is based on INSTANT DIETENE, the only reducing supplement approved for advertising in the Journal of the American Medical Association.

The DIETENE DIET promotes weight loss through nutritional therapy alone. Patients receive FULL nutritional support through a dietetically correct 1000-calorie diet and between-meal DIETENE milk shakes. Safe for cardiacs and hypertensives.



SEND FOR FREE DIETENE AND DIET ANALYSIS

THE DIETENE COMPANY DO-127
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PLEASE SEND ME—FREE—a one pound can of INSTANT DIETENE Reducing Supplement (regular $1.89 size) and an analysis of the DIETENE DIET (Free supply of DIETENE DIET SHEETS included.)

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athlete's foot

- fast relief from itching
- prompt antimycotic action
- continuing prophylaxis

DESENEX® OINTMENT and SOLUTION
Buffered at pH 5.5
POWDER

For most effective and convenient therapy and continuing prophylaxis, use Desenex as follows:

At NIGHT the Ointment (zincundecate)—1 oz. tubes and 1 lb. jars.

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After every FOOT BATH the Solution (undecylenic acid)—2 fl. oz. and 1 pt. bottles. Use only when skin is unbroken.

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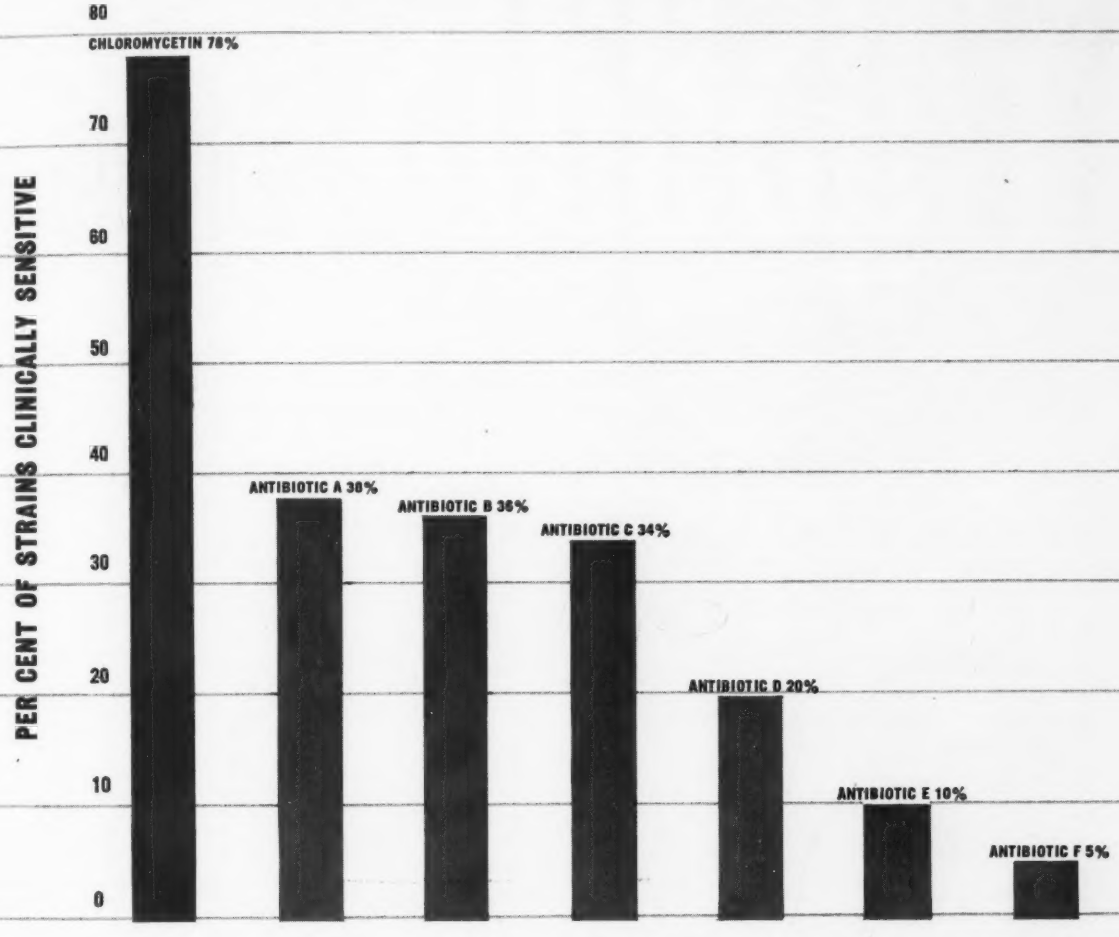

COMPARATIVE SENSITIVITY OF MIXED PROTEUS SPECIES TO CHLOROMYCETIN AND SIX OTHER WIDELY USED ANTIBIOTIC AGENTS*

*This graph is adapted from Waisbren, B. A., & Strelitzer, C. L.: *Arch. Int. Med.* 99:744, 1957. It represents *in vitro* data obtained with strains isolated from patients between the years 1951 and 1956. Inhibitory concentrations, ranging from 3 to 25 mcg. per ml., were selected on the basis of usual clinical sensitivity.

CHLOROMYCETIN (chloramphenicol, Parke-Davis) is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

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Altig, Francis M., from Glendale, Calif., to 5625 Melrose Ave., Los Angeles 38, Calif.

Amalfitano, Louis F., from Philadelphia, Pa., to 19801 Archdale St., Detroit 35, Mich.

Atwood, Chase C., Jr., DMS '57; South Bend Osteopathic Hospital, 2515 E. Jefferson Blvd., South Bend 15, Ind.

Barrette, Roger A., from 3592 Clyde Park, S.W., to 736 36th St., S.W., Grand Rapids 8, Mich.

Barrows, William T., from Oakland, Calif., to 206 W. Anapamu St., Santa Barbara, Calif.

Bean, James F., Jr., from South Pasadena, Calif., to 4924 St. Andrews Ave., Buena Park, Calif.

Bergin, Philip S., from 227 S. Park View St., to 3325 N. Broadway, Los Angeles 31, Calif.

Bigsby, Glenn E., from Coon Rapids, Iowa, to 1832 Locust St., West Des Moines, Iowa

Brickler, Lewis M., from 4558 E. 17th St., to 5348 E. Eighth St., Tucson, Ariz.

Bruno, Anthony M., from Glendale, Calif., to 4922 Hollywood Blvd., Los Angeles 27, Calif.

Bubeck, Roy G., Sr., from 2003 Division Ave., S., to 2851 Clyde Park, S.W., Grand Rapids 9, Mich.

Buonomo, Louis J., from 216 Fifth St., to 717 Bridge St., Colusa, Calif.

Burns, Robert C., from Box 86, to 218 S. Fifth St., Brownfield, Texas

Button, Jennie Tripsin, from Warsaw, Mo., to 156 S. Main St., Fredricktown, Mo.

Button, William E., from Warsaw, Mo., to 156 S. Main St., Fredricktown, Mo.

Caldwell, Della B., from Hotel Victoria, to 1817 E. 12th St., Des Moines 16, Iowa

Choquette, A. A., from Kansas City, Mo., to Pontiac Osteopathic Hospital, 50 N. Perry St., Pontiac, Mich.

Clay, Clifford A., from Johnston, Iowa, to 2647 Beaver Ave., Des Moines 10, Iowa

Coan, James E., from 4159 E. 131st St., to 4010 Warrensville Center Road, Cleveland 22, Ohio

Cochran, John E., from 100 W. Osborn Road, to 345 W. Palo Verde Drive, Phoenix 42, Ariz.

Cohen, Leon, from 1814 Pennington Road, to 1831 Pennington Road, Trenton 8, N.J.

Cohen, Sumner Harriss, from 11674 N.W. Seventh Ave., to 11628 N.W. Seventh Ave., Miami 38, Fla.

Cole, Kenneth L., from 214 E. Eighth St., to 858 E. Front St., Traverse City, Mich.

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when the patient's cold or 'flu is complicated by bacterial infection

Novahistine® with penicillin capsules

- opens clogged air passages
- combats secondary bacterial invasion

Each Novahistine with Penicillin Capsule contains:
Phenylephrine hydrochloride..... 10.0 mg.
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for the "Novahistine Effect"

Penicillin G Potassium..... 200,000 units
for potent antibiotic action when penicillin-susceptible bacteria are secondary invaders

PITMAN-MOORE COMPANY
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announcing...

Novahistine LP* *tablets*

patients with colds... sinusitis ... rhinitis will appreciate the "Novahistine LP Effect"

When a patient begins breathing freely in a few minutes . . . with all air passages cleared . . . and this relief continues for as long as 12 hours after a single dose . . . he is experiencing the "Novahistine LP Effect."

This "Effect" is produced by phenylephrine hydrochloride, a quick-acting, orally effective sympathomimetic, combined with chlorprophenpyridamine maleate, a potent histamine antagonist for synergistic decongestive action . . . on all mucous membranes of the respiratory tract.

Each Novahistine LP Tablet contains:
Phenylephrine hydrochloride.....20 mg.
Chlorprophenpyridamine maleate..... 4 mg.

Supplied in bottles of 50 tablets.

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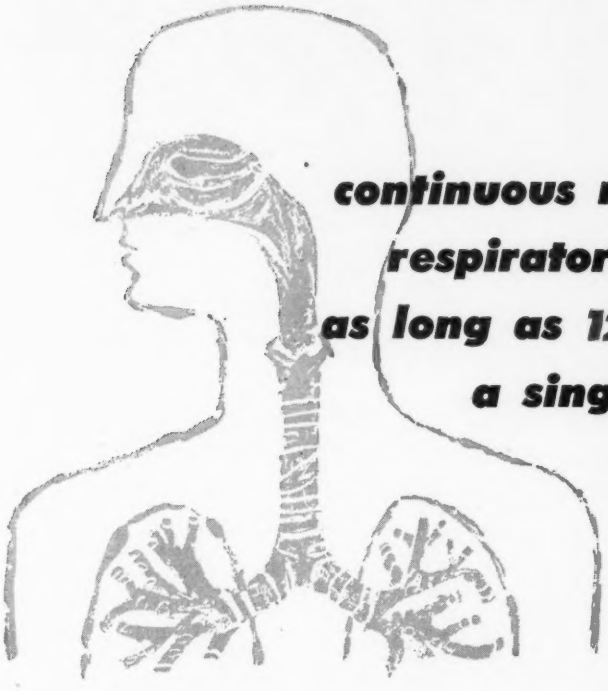
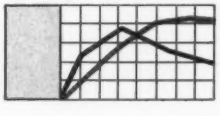
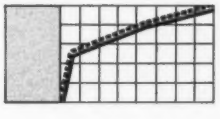


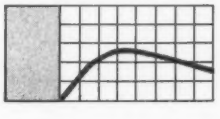
continuous relief of respiratory congestion for as long as 12 hours with a single dose



PROMPT RELIEF
Novahistine LP Tablets start releasing medication almost as rapidly as a solution.



CONTINUOUS RELEASE
Novahistine LP releases its decongestive drugs at a constant rate in both acid and alkaline media . . . assuring patients continuous relief whether the tablet is in the stomach or intestine.



SAFE RELIEF
With Novahistine LP there is no sudden "over-release" . . . no uneven, sporadic effects.

And easy to use, oral dosage eliminates patient misuse of nose drops, sprays and inhalants . . . is not likely to produce rebound congestion, mucosal damage and ciliary paralysis, nor make the patient "jittery."

Administration: Adults—2 tablets twice daily will provide an adequate therapeutic effect in the average patient. In resistant cases, a third daily dose may be indicated and can be safely given. Children over six—one-half the adult dose.

PITMAN-MOORE COMPANY
DIVISION OF ALLIED LABORATORIES, INC., INDIANAPOLIS 6, INDIANA

and...in colds complicated by useless, exhausting coughs

Novahistine-DH*

(fortified Novahistine with dihydrocodeinone)

When "head colds" become "chest colds" Novahistine-DH promptly controls coughs and keeps air passages of both head and chest clear of obstruction.

Each teaspoonful (5 cc.) of grape-flavored Novahistine-DH contains:

Phenylephrine hydrochloride	10 mg.
Prophenpyridamine maleate	12.5 mg.
Dihydrocodeinone bitartrate	1.66 mg.
Chloroform (approx.)	13.5 mg.
l-Menthol	1.0 mg.

Supplied in pint and gallon bottles.

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DeFord, Robert L., from Des Moines, Iowa, to 2813 Iroquois Ave., Long Beach 15, Calif.
Disinger, W. R., from 4159 E. 131th St., to 4010 Warrensville Center Road, Cleveland 22, Ohio

Eisenman, Arnold, from Detroit, Mich., to 2530 Crooks Road, Royal Oak, Mich.
Engstrom, Robert E., from West Los Angeles, Calif., to 127 S. Bowling Green Way, Los Angeles 49, Calif.
Enloe, Garold G., from Garden City, Mich., to 17 S. Jackson St., Farmington, Mo.
Ensign, Rolland E., from Silsbee, Texas, to 26177 Six Mile Road, Detroit 19, Mich.
Evans, Donald J., from 16558 Westmoreland Ave., to 18820 Woodward Ave., Detroit 3, Mich.
Evans, George P., Jr., from 304 W. Bay Drive, to 2025 Indian Rocks Road, Largo, Fla.

Farrow, Charles D., from Erie, Pa., to 1183 N. E. 88th St., Miami 38, Fla.
Flicker, Jerome I., PCO '57; 1235 E. Cardeza St., Philadelphia 19, Pa.
Frazier, Robert M., Jr., from 158 W. Hortter St., to 2015 N. 32nd St., Philadelphia 21, Pa.
Freeman, Elaine Smith, from York, Pa., to 222 York St., Manchester, Pa.
Freeman, Silvion B., from York, Pa., to 222 York St., Manchester, Pa.

Gagliano, Anthony C., from 355 E. Main St., to 2000 Markley St. Norristown, Pa.
Giehm, Donald C., from 34 Morningside Savings Bank Bldg., to 2038 S. St. Aubin St., Sioux City 6, Iowa
Ginsberg, Herbert, from Akron, Ohio, to 8258 Sunland Blvd., Sun Valley, Calif.
Glaspy, Clinton L., from Kansas City, Mo., to 101 E. Jefferson St., Clinton, Mo.
Glover, Julius R., from Bay Village, Ohio, to 2115 Broadway, Lorain, Ohio
Goldberg, Byron W., from Dimondale, Mich., to 2089 N. E. Delhi Ave., Holt, Mich.
Graham, Beach C., from Box 297, to 301 S. Main St., Fowler, Mich.
Gurman, Stanley N., from Scarsdale, N.Y., to 227 Avenue B, Redondo Beach, Calif.

Hailer, William L., from 2057 W. Jefferson Ave., to 2055 Jefferson Ave., Trenton, Mich.
Hartwell, Marion L., from 1654 S. Wilton Place, to 740 S. Flower St., Los Angeles 17, Calif.
Hatch, Loren L., from Hinesville, Ga., to 4001 Buford Highway, Chamblee, Ga.
Haynes, Harvey L., from Zephyr Cove, Nev., to Zephyr Cove, Lake Tahoe, Nev.
Heinlen, W. E., from Joplin, Mo., to 114 42nd St., Des Moines 12, Iowa
Henry, Owen I., from 12523 Third Ave., to 10320 Joy Road, Detroit 4, Mich.
Himelberger, Corydon G., from 26080 E. Huron River Drive, to 29015 Gibralter Road, Flat Rock, Mich.
Hinders, Alvin, from Grand Rapids, Mich., to Gibbsboro, N.J.
Hoover, Lillian Peterson, from Vallejo, Calif., to 323 Geary St., San Francisco 2, Calif.
Huldin, Raymond E., from 42 Wilson Ave., S., to 3090 Wilson Ave., S., Grandville, Mich.

Jones, Paul S., from 133 E. Las Cruces Ave., to 960 N. Main St., Las Cruces, N. Mex.
Joseph, Nathan A., from Box 3, to 162 Second St., Sunfield, Mich.

Kaelber, Charles R., from Manheim, Pa., to 4310 W. Genesee St., Syracuse 9, N.Y.
Kenny, Dennis P., from Highland P.O., to 211 Livingston, Highland, Mich.
Kerscher, Duane J., KCOS '57; Parkview Hospital, 1920 Parkwood Ave., Toledo 2, Ohio

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TABLETS 15 mg. (¼ gr.), 30 mg. (½ gr.), 50 mg. (¾ gr.), 100 mg. (1½gr.), R-A (Repeat Action) 30 mg. and 60 mg.

ELIXIR, 30 mg. (½ gr.) per 5 cc.

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Kuzon, Chester, from Kansas City, Mo., to 159 N. Seventh Ave., Buffalo 25, N.Y.

LaCroix, Eugene E., from Seattle, Wash., to 729 W. McDowell Road, Phoenix 32, Ariz.
Lange, Joseph E., from Parma, Mo., to Cuba, Mo.
Lawrance, Orren J., from 5545 Ninth St., N., to 3140 34th St., N., St. Petersburg 13, Fla.
Lentz, Roland G., CCO '56; Chicago Osteopathic Hospital, 5250 S. Ellis Ave., Chicago 15, Ill.
Levy, Ronald R., from 708 "B" Bay St., to 1533 Yale St., Santa Monica, Calif.
Lindblom, R. C., from 6124 Milwaukee Ave., to 7222 W. Myrtle Ave., Chicago 31, Ill.
List, John W., from Box 548, to 313 W. Yucaipa Blvd., Yucaipa, Calif.
Long, Leland C., from Lewisville, Texas, to 204 Houston, Lamesa, Texas

Manieri, R. George, from 833 DeKalb St., to 1548 DeKalb St., Norristown, Pa.
Marr, James F., from Ninth St. & Jackson Ave., to 708 S. 49th W. Ave., Tulsa 7, Okla.
Marra, Charles N., from Armonk, N. Y., to Lancaster Osteopathic Hospital, Lancaster, Pa.
Martin, Andrew J., from Midwest City, Okla., to Box 168, Nicoma Park, Okla.
Matousek, John A., from Weirton, W. Va., to Box 362, York Harbor, Maine
Meaney, William E., from Des Moines, Iowa, to Kirksville College of Osteopathy & Surgery, Kirksville, Mo.
Meyers, Henry J., from Flushing, L.I., N.Y., to 83-75 Woodhaven Blvd., Woodhaven 21, L.I., N.Y.
Morgan, Wallace E., from San Leandro, Calif, to 2761 Pacific Ave., Long Beach 6, Calif.
Murphy, Nathan H., from 531 Citizens Bank Bldg., to 1107 W. Eighth St., Anderson, Ind.

Neff, Dorothy, from 246 W. Orange St., to 326 E. Orange St., Lancaster, Pa.
Newman, Delle A., from Oak Park, Mich., to 18903 W. Seven Mile Road, Detroit 19, Mich.

Olen, Henry F., from 227 Michigan St., N.E., to 754 W. Fulton St., Grand Rapids 4, Mich.
Olson, Albert R., from St. Clair Shores, Mich., to 56040 Van Dyke, Washington, Mich.
Osder, Robert, from 3704 Junction St., to 18201 Joy Road, Detroit 28, Mich.

Parker, Edwin L., from Lubbock, Texas, to Art Centre Hospital, 5435 Woodward Ave., Detroit 2, Mich.
Patterson, Glenn A., from Box 71, to Box 140, Braman, Okla.
Patterson, H. R., from 317 First Federal Bldg., to 3013 Harrison St., Davenport, Iowa
Payne, Rachel A., from 2129 S. W. 59th St., to 4036 Rancho Drive, Oklahoma City 19, Okla.
Pearson, R. C. John, from Federal Way, Wash., to 7910 35th Ave., S.W., Seattle 6, Wash.
Pizey, Bryce A., from San Pedro, Calif., to Box 1073, Mammoth Lakes, Calif.
Pultz, F. G., from 725 Capital Ave., S.W., to 67 Porter St., Battle Creek, Mich.
Pyne, Louis G., from Hollywood, Calif., to Box 66-A, Capistrano Beach, Calif.

Redwine, James W., from Pomona, Calif., to Long Beach Osteopathic-Magnolia Hospitals, 2776 Pacific Ave., Long Beach 6, Calif.
Rehman, Jerome, from 515 E. 231st St., to 535 E. 231st St., Wilmington, Calif.
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and it costs no more than ordinary iron preparations

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(MOLYBDENIZED FERROUS SULFATE)

preparations

For comprehensive nutritional support

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"Just 2 for 2"... 2 tablets a day give comprehensive mineral-vitamin support (including phosphorus-free calcium and vitamin K) required by both mother and child.

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Each tablet equals one MOL-IRON tablet plus 250 mg. of phosphorus-free calcium and 200 U.S.P. Units of vitamin D.

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White Laboratories, Inc., Kenilworth, New Jersey

while the patient sleeps

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vanilla-flavored laxative

works gently
to produce a normal
bowel movement
in the morning.

Dosage: One tablespoonful at bedtime

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Ruza, Paul L., from Detroit, Mich., to 7087 Inkster Road, Garden City, Mich.

Schwartz, Ralph, PCO '56; Holiday House, Route 6, Bridgeton, N.J.
Schwartz, Samuel S., from Kansas City, Mo., to 316 W. Kaler Drive, Phoenix 52, Ariz.
Scott, Norla B., from 106 Hart Bldg., to 512 Government Way, Coeur d'Alene, Idaho
Seydler, W. A., from Box 285, to Box 96, Stanfield, Ariz.
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Sharp, Omer L., from 1873 Campus Road, to 6411 Monterey Road, Los Angeles 42, Calif.
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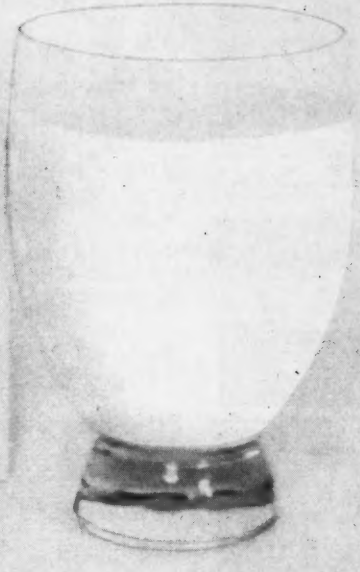

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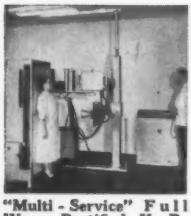

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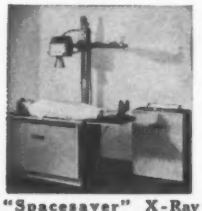

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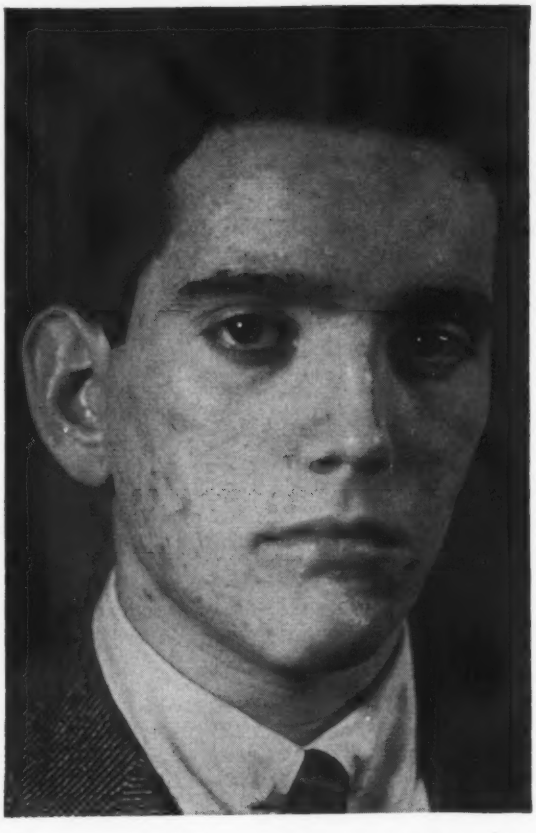

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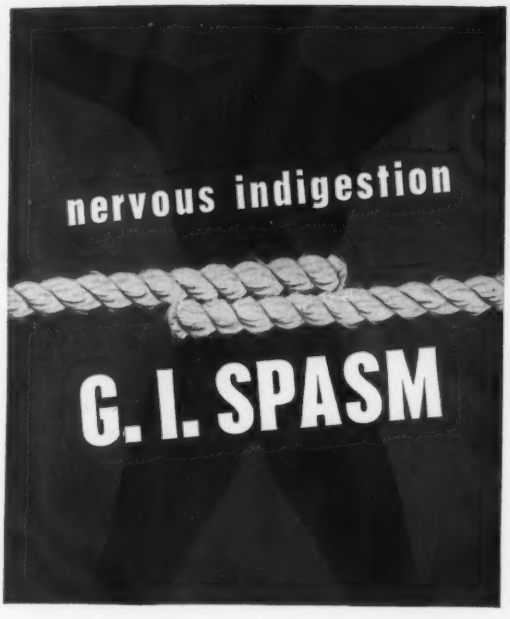

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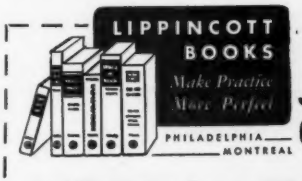

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